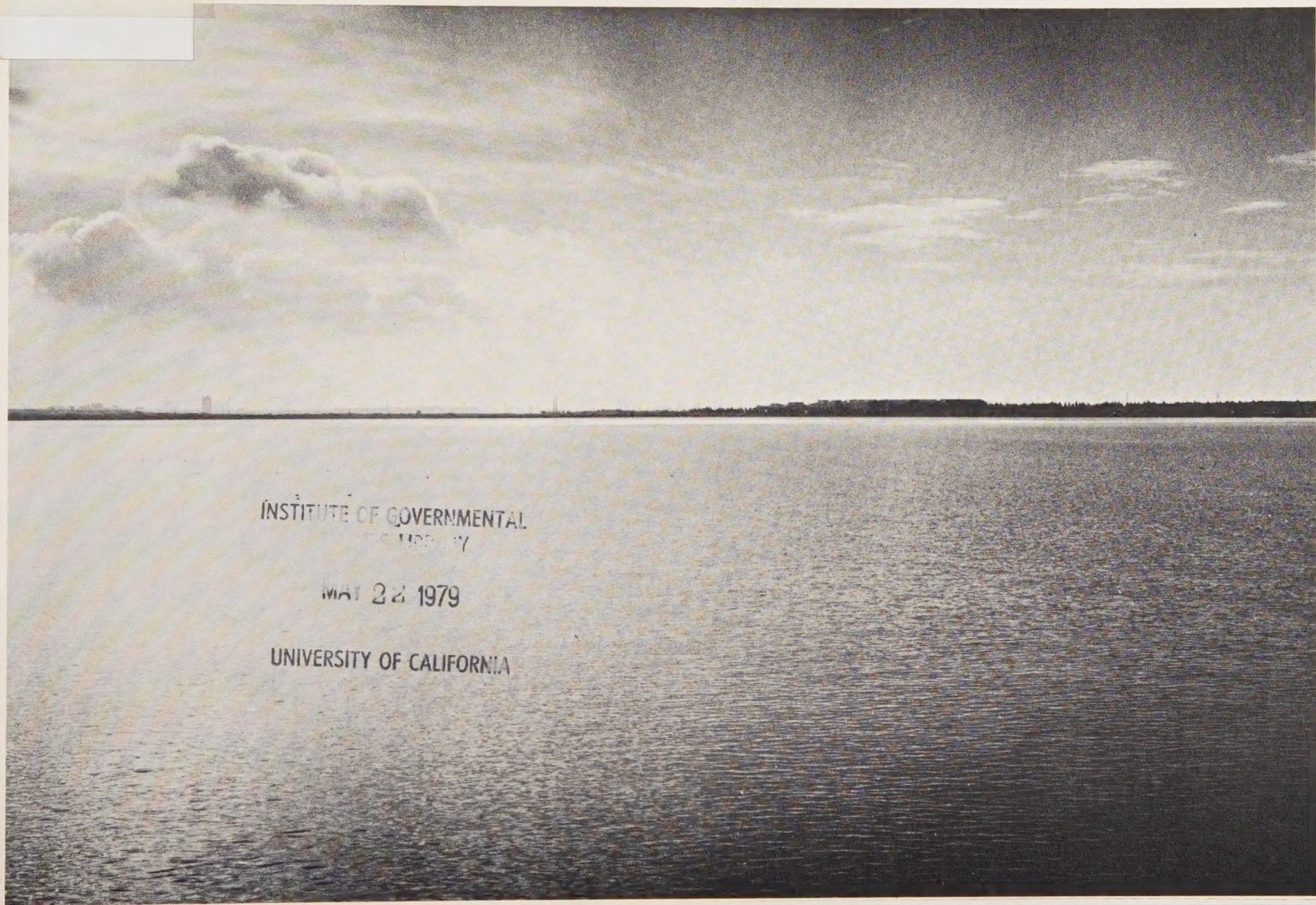


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UNIVERSITY OF CALIFORNIA

# berkeley waterfront summary report

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# BERKELEY WATERFRONT SUMMARY REPORT



prepared for

City of Berkeley, California

prepared by

Eckbo, Dean, Austin & Williams  
Landscape Architects & Urban Designers  
145 Mission Street  
San Francisco, California 94105

Consultant

Deleuw, Cather & Company  
Engineers, Western Office

February 1, 1972



## TABLE OF CONTENTS

Page

|  |     |
|--|-----|
| Letter of Transmittal  | 1.  |
| Introduction   | 2.  |
| <u>Relation of Summary Report to</u><br><u>Previous Studies.</u> |     |
| Preliminary Design Alternatives                                  |     |
| Alternate A  | 4.  |
| Alternate B  | 5.  |
| Alternate C  | 6.  |
| Findings and Recommendations                                     | 7.  |
| Waterfront Environs  |     |
| Contract Scope of Service Elements                               |     |
| (1) Freeways and Interchanges                                    | 10. |
| (2) Lagoons  | 10. |
| (3) Traffic Engineering  | 11. |
| (4) Heliport Location  | 12. |
| Summary  | 14. |
| Appendix   |     |







## INTRODUCTION:

The original Berkeley Waterfront study developed as a result of certain requests by the City, contained in a Contract dated June 3, 1966, between the City and Eckbo, Dean, Austin & Williams. These requests were:

1. Comprehensive study of a general design and development concept for all of the City area west of the Eastshore Freeway and east of the bulkhead line, plus the Aquatic Park area; incorporating major public recreation; commercial-recreation; commercial-recreational and office uses; possible new freeway; land fill needs; parking and circulation; visual attributes and importance of landscaping.
2. Three alternate design and development plans:
  - A. Containing commercial-recreation and office use on existing fill.
  - B. Containing commercial-recreation, and office use on additional fill.
  - C. Containing commercial-recreation, office use and a junior college site.

The Contract was formulated as a result of certain recommendations embodied in the February 4, 1966, Progress Report of the Advisory Committee on Waterfront Planning. The Report begins with demands for:

Maximum use by the general public.  
Maximum compatibility of uses and harmony of design.  
Maximum harmony with the marine environment and with the objectives of the Bay Area Conservation and Development Commission.

The urgency of the planning study derived from certain existing or imminent problems:

Construction of Marina Park.  
Petitions for reclassification by waterfront property owners Mr. Murphy and the Santa Fe Railroad.  
Impending second freeway with interchanges.  
Impending availability of substantial quantities of fill material from Rapid Transit construction.  
Work of the Bay Area Conservation and Development Commission.  
Relationships between waterfront, Aquatic Park and the foot of University Avenue.

The Committee, therefore, recommended the development of three alternate plans for the waterfront area; "all private and public lands west of the Eastshore Freeway and...include Aquatic Park." The plans were to observe certain policies which limited fill to wind protection, landscaping needs, a more natural shoreline, the extension of commercial uses or parking areas with required parking to be minimized visually; and the inclusion of scenic drives, view-points, pedestrian and bicycle paths in the circulation system, required the "creation of visual enjoyment" through a "varied and interesting shoreline;" established the primary importance of "landscape," including "hills, valleys, basins, mounds, and other earth forms;" shoreline and dry land landscaping, wind tolerant trees and plants, pathways, bridges, walks, gates, plazas, stone, masonry, underground utilities, and lighting.

Elements of the plan were listed as:

1. Recreation; including pedestrian access, picnicking,



siting areas, beach activities, general open areas, turf areas jointly used by public and educational institutions. Commercial-recreational facilities including boat launching and other Marina facilities, public floats, a 9-hole par 30 short golf course with driving range, and anchorage north of the present Murphy property.

2. Second Freeway, minimizing the barrier between city and waterfront, providing a "broad and felicitous causeway for pedestrian travel," and considering overpasses at Dwight and Cedar.
3. Commercial-recreational and office development, including consistent design plans for varying acreages.
4. Heliport, hovercraft, bus terminal.
5. Architecturally significant structure, as civic symbol and qualitative landmark.
6. Junior college.

Development cost estimates were also requested.

The following are the design and development plans that were in the preliminary report of 1966.





## ALTERNATE A - SUMMARY

Commercial, recreation and office use on existing fill.

University Avenue overpass reconstructed to incorporate pedestrian use and to become an imposing gateway or landmark structure.

Water canal proposed between north and south basins.

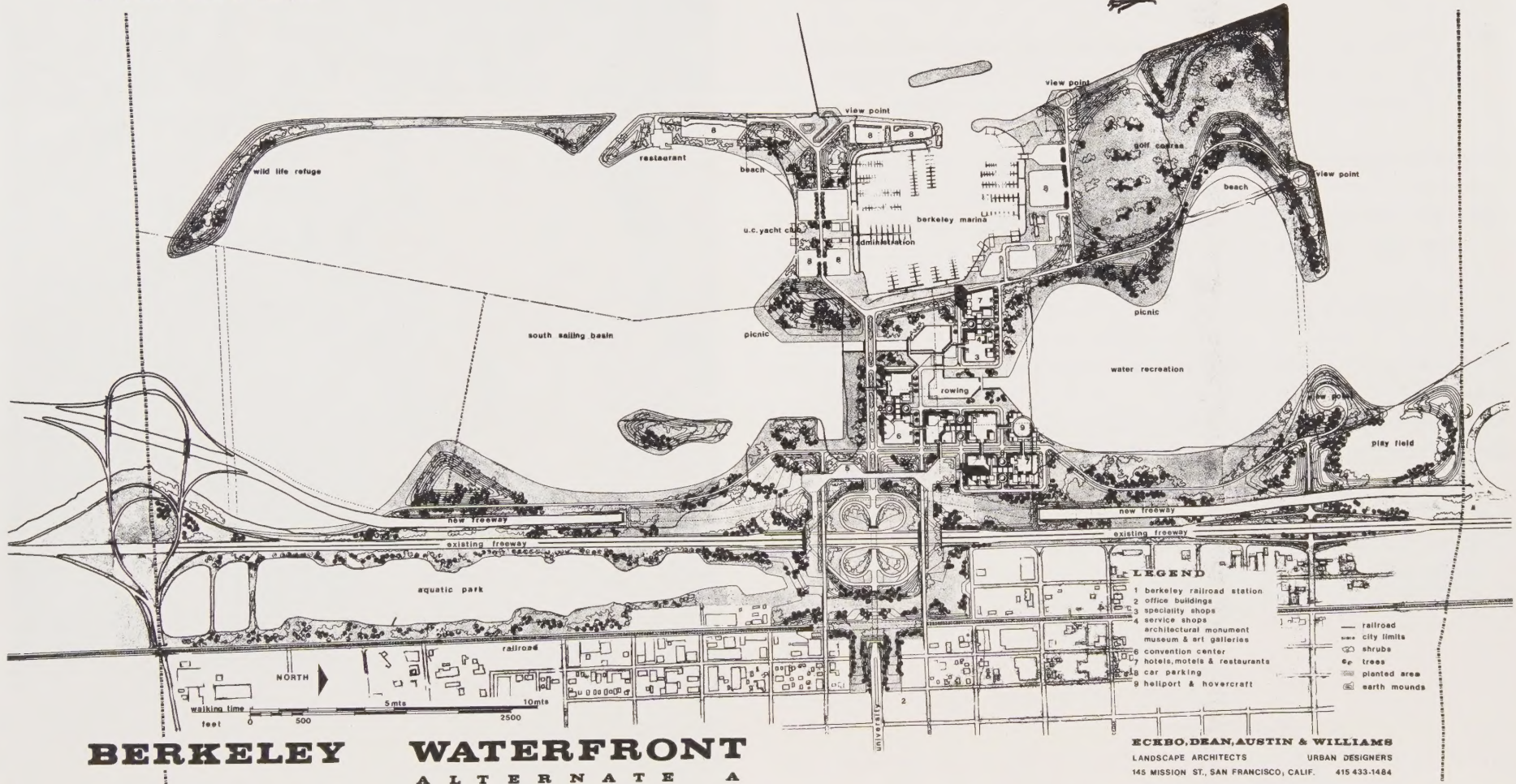
New freeway below grade.

Recreation uses developed on fill over refuse area.

Commercial and office uses north of University Avenue extension.

## COST SUMMARY

|                         |              |
|-------------------------|--------------|
| New freeway             | \$20,130,000 |
| Existing freeway        | 4,536,000    |
| RR tunnel and new roads | 2,578,000    |
| Central connection      | 3,780,000    |
| Commercial area         | 2,106,000    |
| North of University     | 3,208,000    |
| South of University     | 7,834,000    |
| Fill                    | 1,190,000    |
|                         | <hr/>        |
|                         | \$45,362,000 |



**BERKELEY**

**WATERFRONT**  
ALTERNATE A

**ECKBO, DEAN, AUSTIN & WILLIAMS**  
LANDSCAPE ARCHITECTS URBAN DESIGNERS  
145 MISSION ST., SAN FRANCISCO, CALIF. 415 433-1484



## ALTERNATE B - SUMMARY

Commercial, recreation and office use on additional fill land.

Existing University Avenue overpass remodeled for pedestrian use, and as gateway structure.

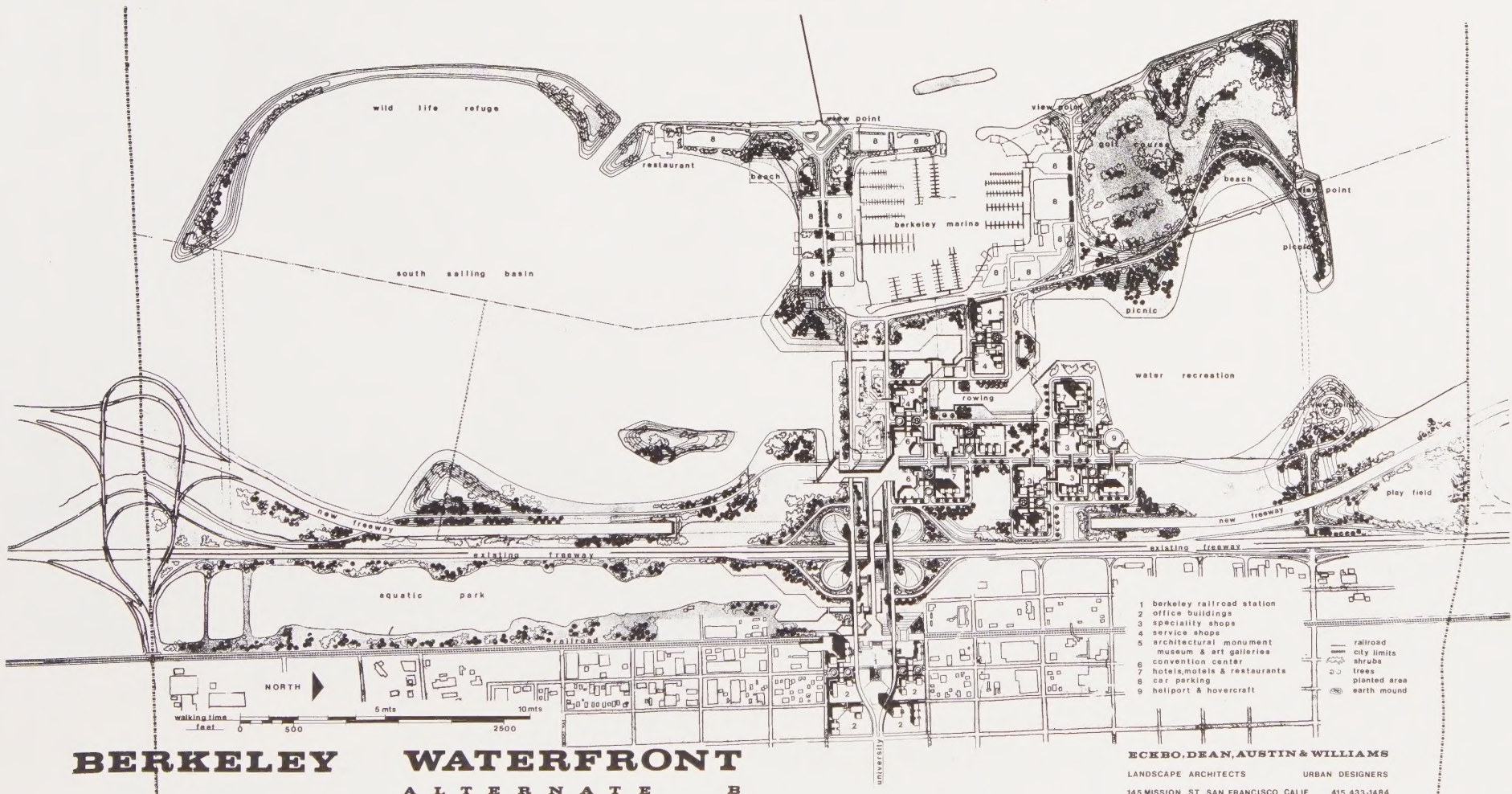
Commercial and office complex extends into north basin.

New freeway is below grade.

Water canal connects north and south basin.

## COST SUMMARY

|                           |              |
|---------------------------|--------------|
| New freeway               | \$20,527,000 |
| Existing freeway          | 3,960,000    |
| R.R. tunnel and new roads | 2,794,000    |
| Central connection        | 1,782,000    |
| Commercial area           | 3,361,000    |
| North of University       | 3,293,000    |
| South of University       | 8,035,000    |
| Fill                      | 1,190,000    |
|                           | <hr/>        |
|                           | \$44,942,000 |





## ALTERNATE C - SUMMARY

Commercial, recreation, office, and junior college uses.

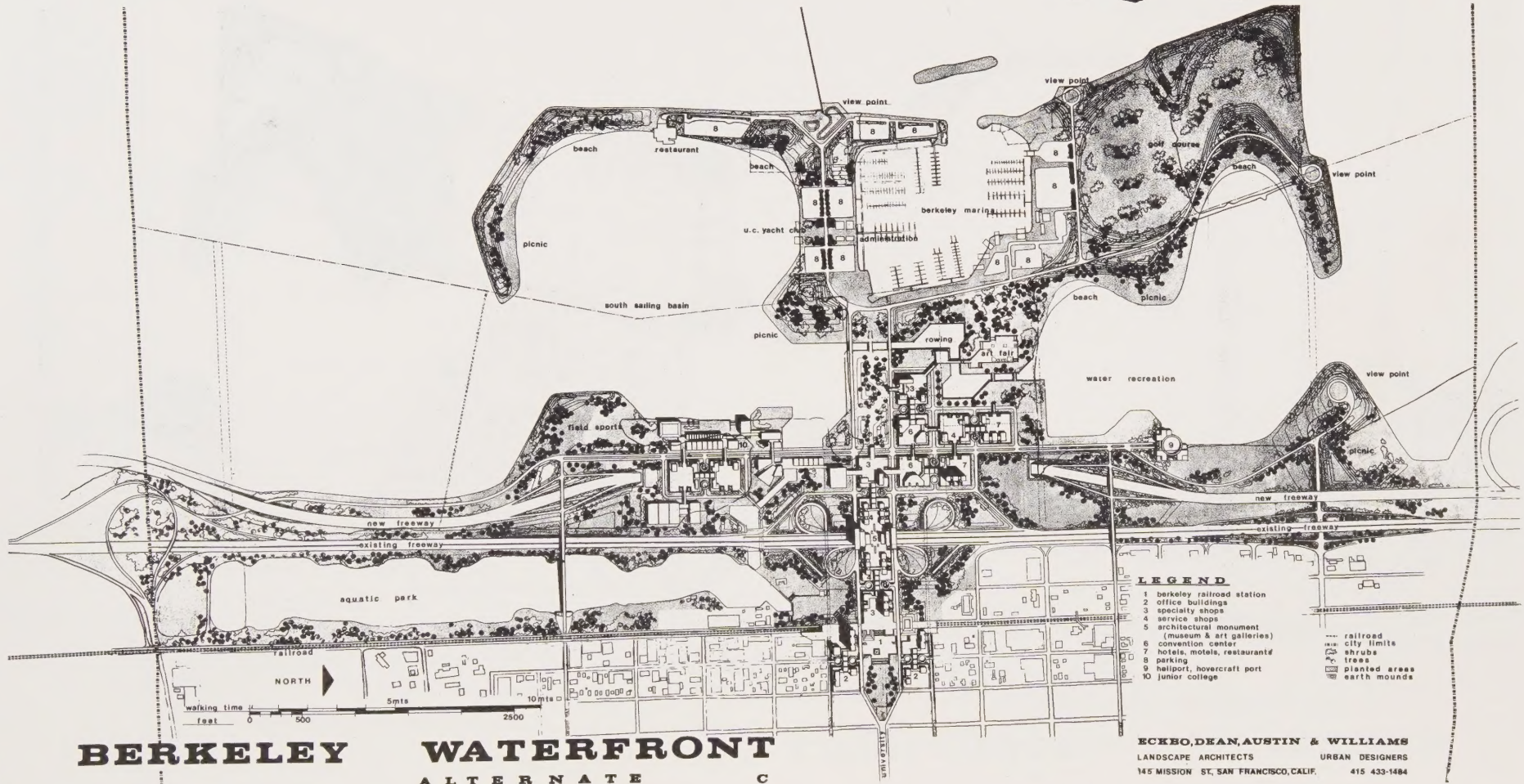
University Avenue overpass remodeled and developed as a major urban/commercial plaza with shops, museums, art galleries, offices, and parking structure.

Junior college is located along the south shore (66 acres) - 40 acres new fill.

Separate service road to junior college from Dwight Way and the freeways.

## COST SUMMARY

|                           |              |
|---------------------------|--------------|
| New freeway               | \$22,532,000 |
| Existing freeway          | 5,554,000    |
| R.R. tunnel and new roads | 2,754,000    |
| Central connection        | 832,000      |
| Commercial area           | 2,863,000    |
| North of University       | 4,111,000    |
| South of University       | 6,193,000    |
| Junior College            | 1,298,000    |
| Fill                      | 1,190,000    |
|                           | <hr/>        |
|                           | \$47,327,000 |



ECKBO, DEAN, AUSTIN & WILLIAMS  
LANDSCAPE ARCHITECTS URBAN DESIGNERS  
145 MISSION ST., SAN FRANCISCO, CALIF. 415 433-1484



## FINDINGS AND RECOMMENDATIONS

The Design Alternatives for the Berkeley Waterfront were accepted by the City of Berkeley as tentative plans. Emphasis was given to conclusion #1, permanent open space and to conclusion #2, junior college development over commercial-office development.

Since 1967:

- Citizens groups have prepared plans recommending the waterfront be developed as permanent recreational open space.
- Peralta Junior College District has abandoned plans for a junior college campus.
- The City Council has continued policies limiting bay fill.
- The City Council has endorsed the development of the refuse area for recreational uses.
- The State of California established a permanent Bay Conservation and Development Commission which has produced a Bay Plan which recommends the preservation and development of almost all of the Berkeley Waterfront as public recreational open space.
- The Association of Bay Area Governments in its Regional Plan 1970-1990 endorses the BCDC recommendation.
- The City Council denied a reclassification application which would have allowed the development of a regional shopping center on 84 acres north of University Avenue extension.

Our interim report states under Conclusions: 1.

"No doubt the principal physical and social need of the City is for additional park-like open space for recreation and relaxation. Therefore, the City would be best served if all of the waterfront land could be preserved as public open space."

Having considered the events hereto stated and recognizing public concern for the preservation and enhancement of available open land by designating it as permanent open space, we recommend to the City of Berkeley:

1. That it reaffirm the Advisory Committee on Waterfront Planning's statement of values:

Beauty

Contact with the Natural Environment

Compatibility with the Marine Environment

Emphasis on Civic Pride

Availability to all Citizens

Emphasis on Creative Harmony of man and shore

Emphasis on Harmony of Man's Spirit and the sea

We would add here:

Emphasis that man is biologically and spiritually related to plant and animal life and this relationship must be carefully preserved.

2. That it designate all of the waterfront lands, including private ownerships, as a regional marine park.



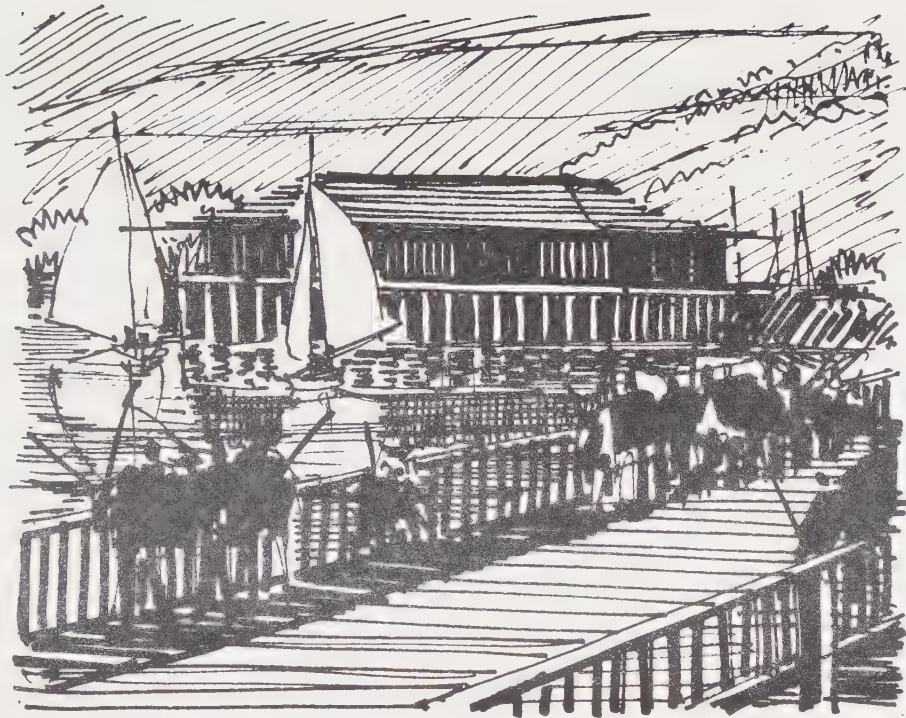


3. That it endorse the following goals:

- a. To develop the waterfront park so that it will connect and complement the adjacent north and south bay land and Aquatic Park.
- b. To develop the land in a manner consistent with the objectives and policies of the San Francisco Bay Conservation and Development Commission.
- c. To develop the waterfront park in a manner which will encourage and expand the wildlife and natural ecology of the area.
- d. To develop the land so that it provides maximum bayshore access and recreation.
- e. To develop a variety of recreation opportunities in a manner which is consistent with the unique landscape character of the bayshore landscape.









## CONTRACT SCOPE OF SERVICES ELEMENTS:

The following traffic, freeway and interchange statements are a summary of the traffic and Highway Design Studies for the Berkeley Waterfront Study in 1967, by Deleuw, Cather and Company. Primary information and data was obtained from the District Office of the California Division of Highways and from the City of Berkeley.

### (1) Freeways and Interchanges

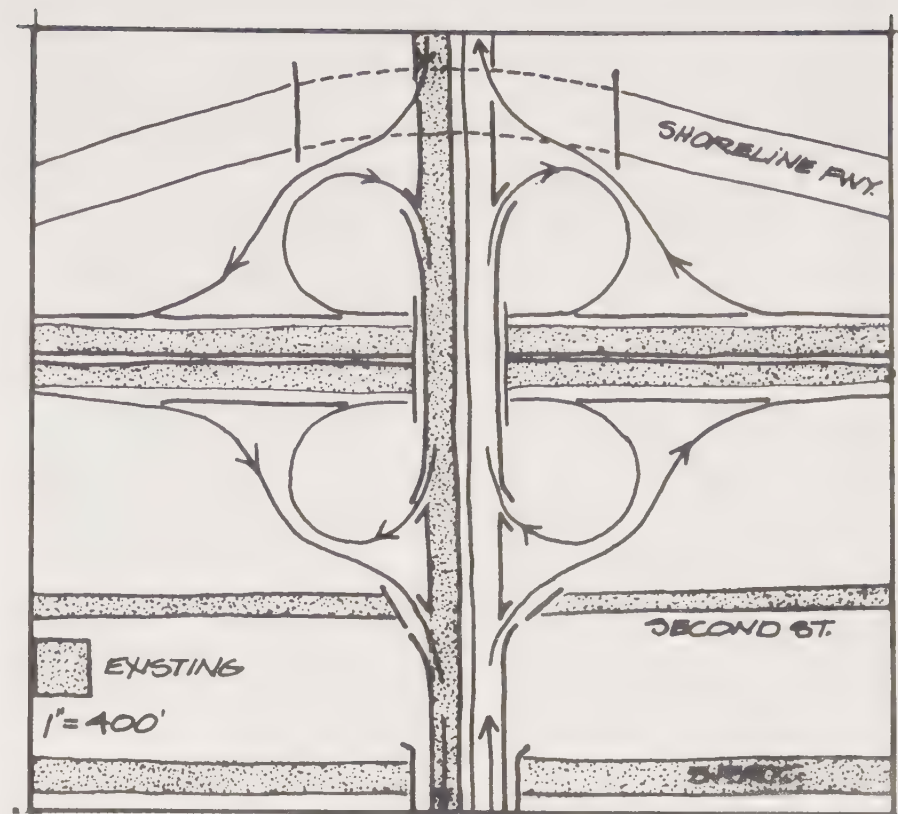
#### a. (1 and 2)

#### Submerged or on-grade freeway West of East Shore Freeway:

Based upon a number of as-built plans for the East Shore Freeway, the interceptor sewer, the Strawberry Creek outfall and supplementary information, it was determined that the future Shoreline Freeway would have to be constructed essentially at grade. Poor soils conditions coupled with numerous utility problems led to this conclusion, and in addition, the serious problems posed by the provision of mechanical ventilation drainage and related problems that a below grade freeway would generate. Cost Estimate on-grade freeway \$920,000 to \$1,250,000 per mile.

#### b. Interchange Reconstruction: East Shore Freeway and University Avenue.

Studies have indicated that a full cloverleaf interchange would provide the most satisfactory solution. If remodeled, the existing structure can be retained to serve east bound traffic, with a parallel structure constructed for westbound traffic.



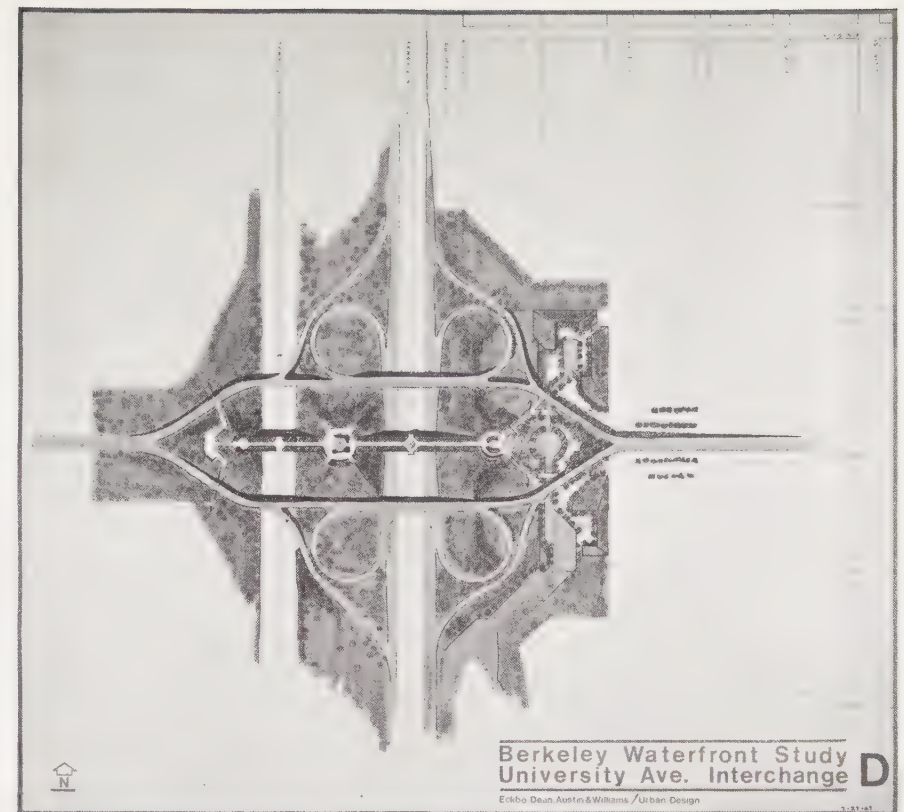
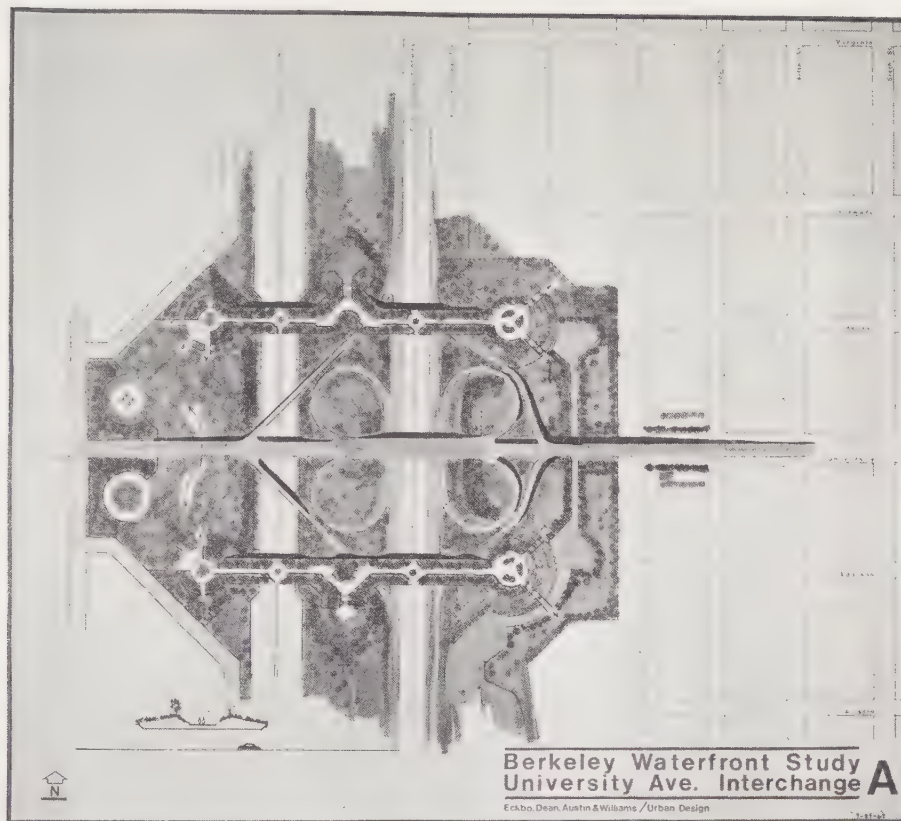
University Avenue Interchange Diagram

The functional plan does not recognize the gateway landmark, civic symbol or significant architectural objectives embodied in the three alternative designs in the original 1966 report. Cost estimate for above plan, 1967: \$1,270,000. (Excluding Shoreline Freeway)

### (2) Lagoons

Construction of tidal canals and lagoons as shown in our Alternative Plans A, B, & C, have been determined to be very expensive if not technically unfeasible. Land locked ponds are technically possible. However, the high water table and the unstable fill material would require a very expensive engineering solution.





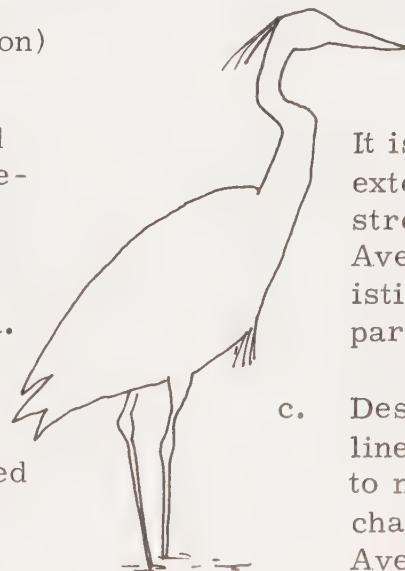
Alternative University Avenue Interchange Designs: Extension of Aquatic Park Lagoon, connecting pedestrian paths, and landscape treatment with trees, grass, ground covers and shrubs.

Plan A Construction (1967) \$3,950,000  
(excluding shoreline freeway and land acquisition)  
(3) Traffic Engineering

Projections of 1980 traffic were assigned to the University Avenue East Shore Freeway Interchange and included through traffic, traffic destined to and from Berkeley and traffic generated by the ultimate development of Berkeley Marina. (See page 12)

a. and b.

In the event a Junior College is located west of the freeway, additional traffic will be generated within the Marina.



Plan D Construction (1967) \$4,850,000  
(excluding shoreline freeway and land acquisition)

It is our recommendation to provide an extension of major east-west collector streets, probably Dwight Way and/or Cedar Avenue by means of structures over the existing East Shore Freeway and the proposed parallel Shoreline Freeway.

- c. Design information for the addition Shoreline Freeway is not yet sufficiently advanced to make possible the study of diamond interchanges between the new freeway, University Avenue, and Marina Collector roads.



## Trip Generation Chart

| Land Use       | Quantity               | Generation Rate |       |           | Trips 2-Way |          |        |
|----------------|------------------------|-----------------|-------|-----------|-------------|----------|--------|
|                |                        | AM PK           | PM PK | ADT       | AM PK HR    | PM PK HR | ADT    |
| Junior College | 3000 stu.<br>60-70 AC. | .25             | .20   | 2.5/stu.  | 750         | 600      | 7500   |
| Shops          | 5000 sq. ft.           | --              | 4     | 35/1000   | --          | 20       | 150    |
| Motel          | 60 Units               | .75             | .75   | 3/Unit    | 45          | 45       | 180    |
| Restaurant     | 400 Seats              | --              | 1     | 4/Seat    | --          | 400      | 1600   |
| Office         | 20,000 sq. ft.         | 3               | 3     | 13/1000   | 60          | 60       | 260    |
| Golf Course    | 18 Hole                | --              | --    | --        | --          | 75       | 750    |
| Heliport       |                        |                 |       |           | 30          | 30       | 100    |
| Marina         | 400 Berths             | .3              | .5    | 4.2/Berth | 120         | 200      | 1700   |
| TOTAL          |                        |                 |       |           | 1000        | 1430     | 12,250 |

### (4) Heliport Location

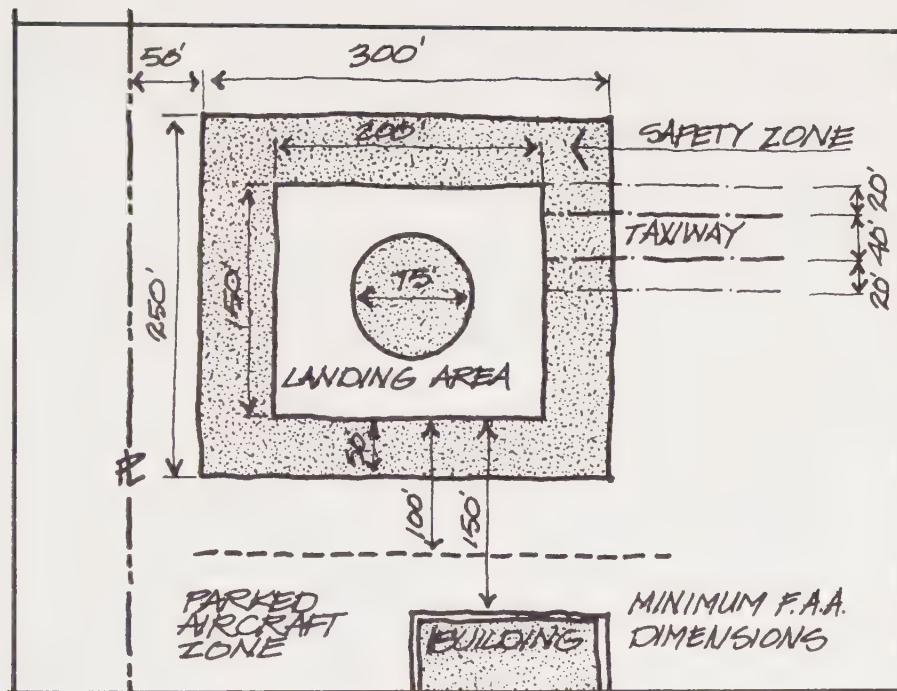
Design Criteria was developed with the assistance of Art Tobey of the San Francisco Helicopter service and the F.A.A. Heliport Design Guide.

- a. Future helicopter will be a Class III craft, 100' long with a 75' rotor diameter.
- b. Service facility in Berkeley is a Helistop allowing for the loading and unloading of one helicopter and space for emergency maintenance.

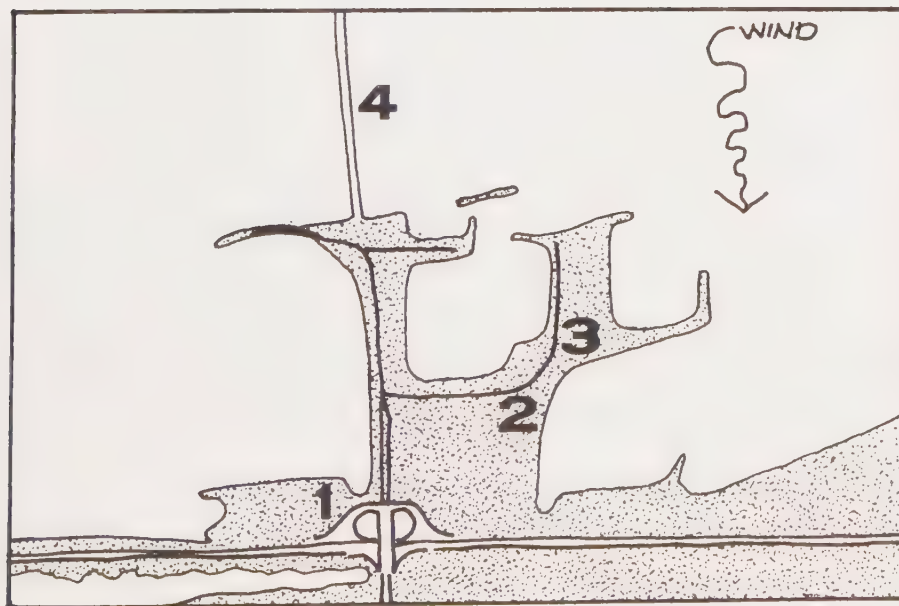


- c. Desirable line of approach is from Albany and landing directly into prevailing westerly winds.
- d. Space requirements Class III helicopter from F.A.A. Heliport Design Guide.

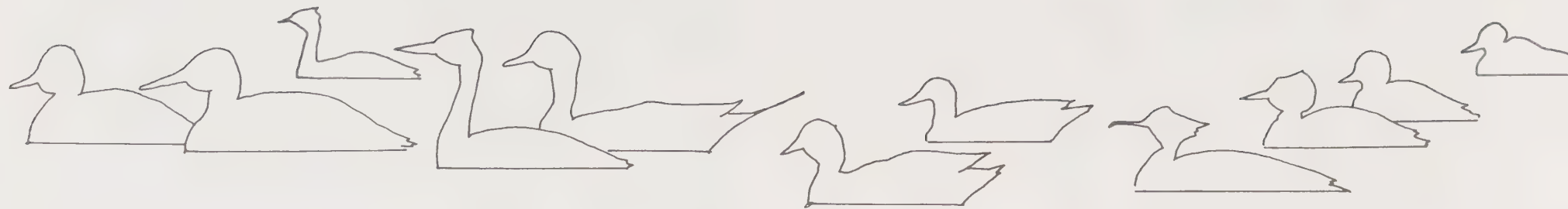




Considering the functional criteria of a Helistop and future use of the land, Site No.3 appears the most desirable alternative and Site No. 1, next appropriate.



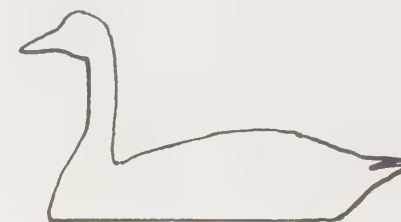




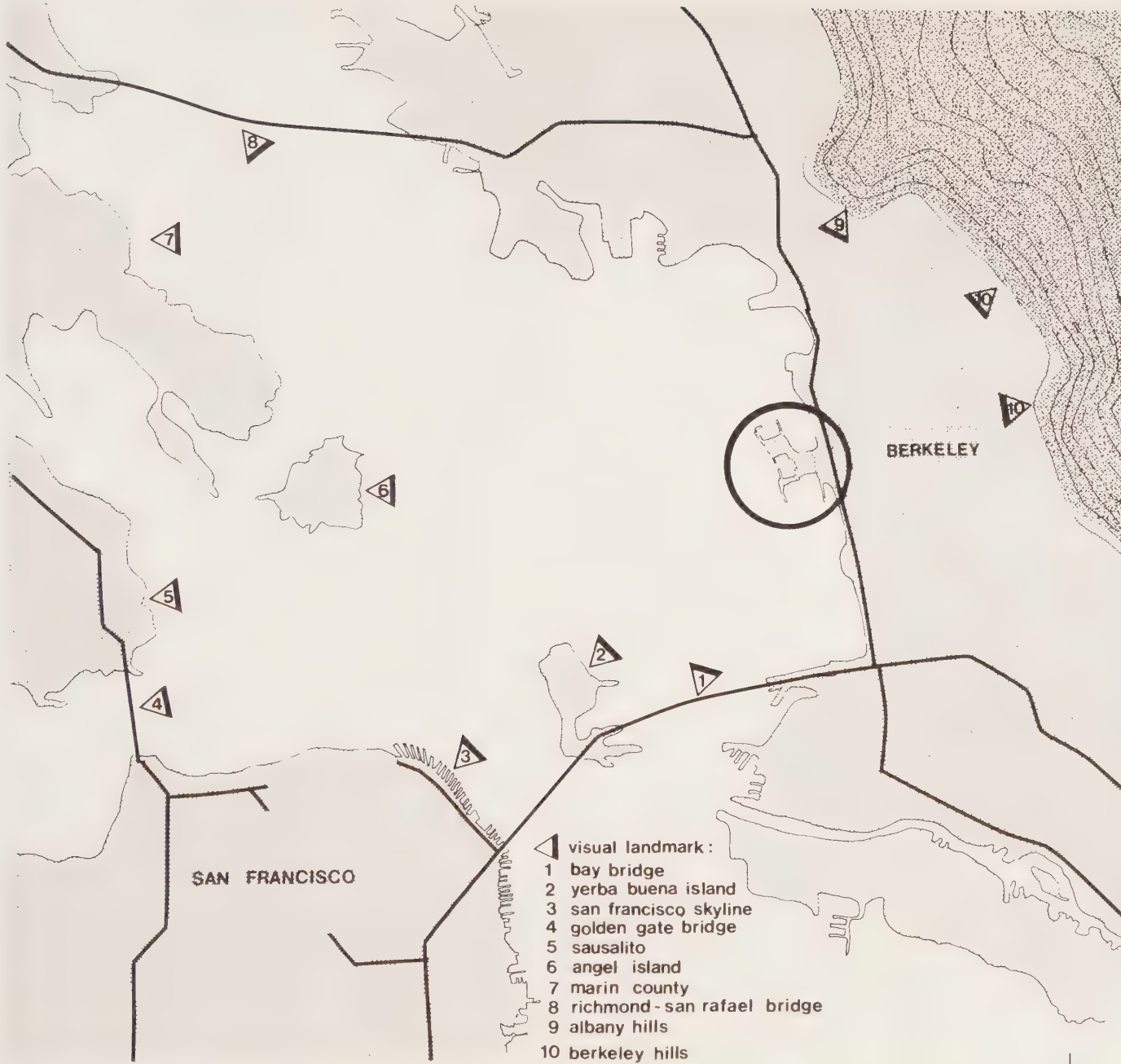
In this and the previous Berkeley Waterfront Study we have explored alternative commercial-recreational-educational treatments for the waterfront lands and their freeway interchange connections with the City. We have considered the relationships between development and open space needs, and between the technical requirements of traffic engineering, new freeway and interchange structures, lagoons, and a new heliport. We have looked closely at the Marina Park developed area west of the private ownership line, and at the raw lands between that line and the Eastshore Freeway. We have examined the City of Berkeley, through the residency of our principal Garrett Eckbo and several Senior Associates and Associates in the firm, as a structure of buildings, open spaces, and traffic corridors for community life. We have considered the relationship of this city to its neighbors north and south on the eastshore of the Bay, and to San Francisco, the Golden Gate, and Marin County across the Bay to the West.

We have come to the conclusion that Berkeley has a number of serious environmental needs. It needs jobs, housing, child care, health care, and better educational opportunities for the less

And it needs expanded open space and recreational facilities for all sectors of the population. It does not appear to us that the less privileged sector needs can properly be provided in the waterfront lands. But we are convinced that those lands are ideal for recreational open space to serve the entire city, and more particularly the less privileged sectors which live closer to it. Tilden Park and the other hilltop regional parks serve hilltop dwellers, and others with adequate transportation access very well. A major waterfront park, with good access over the freeway, would complement and balance those hilltop facilities, provide a totally different kind of recreational environment, and give the flatlands of Berkeley open space comparable to that available to the hill areas. We, therefore, recommend that a serious study be made of ways and means available for control, acquisition, and development of those waterfront lands.







Location Map - Berkeley Waterfront









The appendix is a collection of technical information that was developed for Traffic and Highway Design Studies by Deleuw, Cather and Company, and Heliport Design Requirements by Eckbo, Dean, Austin & Williams. Eckbo, Dean, Austin & Williams releases this information to the City of Berkeley to be used specifically as a reference material for future Berkeley Waterfront Planning.







DE LEUW, CATHER & COMPANY  
ENGINEERS  
WESTERN OFFICE  
1256 MARKET STREET  
SAN FRANCISCO 2, CALIFORNIA  
UNDERHILL 1-1302

June 20, 1967

Mr. Garrett Eckbo  
Eckbo, Dean, Austin and Williams  
145 Mission Street  
San Francisco, California 94105

Subject: Traffic and Highway Design Studies  
Berkeley Waterfront Study

Dear Mr. Eckbo:

In accordance with our agreement of March 16, 1967, we are pleased to present this summary of our findings, conclusions and recommendations on our studies of the traffic and access problems in connection with the Berkeley marina development. During the course of our work we obtained data and information from the District Office of the California Division of Highways, from the City of Berkeley and from others, which form the basis for the traffic assignments and projections and resultant preliminary geometric design studies.

Our work is summarized as follows:

Traffic

Projections of 1980 traffic were assigned to the University Avenue-East Shore Freeway interchange and included through traffic, traffic destined to and from Berkeley and traffic generated by the ultimate development of the Berkeley marina. Traffic assignments are summarized in the sketch material discussed with you.

Traffic Analysis

Following determination of the 1980 traffic requirements, analyses were undertaken to determine interchange requirements at University Avenue and East Shore Freeway. It was determined that provision should be made for traffic movements in all four quadrants, in eight directions at the interchange to accommodate future traffic.

Preliminary Geometric Design Studies

Based upon a number of as-built plans for the East Shore Freeway, the interceptor sewer, the Strawberry Creek outfall and supplementary information, it was determined that the future Shoreline Freeway (parallel







to and west of the existing East Shore Freeway) would have to be constructed essentially at grade. Poor soils conditions coupled with numerous utility problems led to this conclusion, in addition to the serious problems posed by the provision of mechanical ventilation, drainage and related problems which would exist if the freeway were to be constructed below grade and partially or completely covered through the marina area.

Our studies indicated that a full cloverleaf interchange between the East Shore Freeway and University Avenue would provide the most satisfactory solution from all points of view. A portion of the existing interchange structure and some of the ramps could be utilized in the future construction of a full cloverleaf interchange.

We recommend that the existing structure over the East Shore Freeway be retained to provide for traffic in one direction with a parallel structure constructed for traffic in the opposite direction. The recommended preliminary geometric design is shown on sketches which have been given to you.

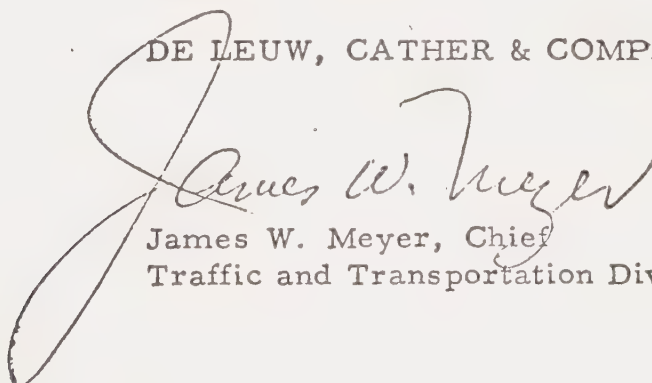
#### Junior College Site

In the event that the proposed Junior College site is relocated to the area south of University Avenue, with the area north of University Avenue being devoted to commercial and/or industrial utilization, then some additional traffic will be generated within the marina area. In this event, it would be our recommendation to provide an extension to Cedar Street which would provide secondary access to the marina area via a structure over the existing East Shore Freeway and the proposed parallel Shoreline Freeway. As a matter of fact, this structure should probably be provided in any event in the long-range future to provide a relief access facility to the marina development.

We look forward to having further discussions with you and the city and to providing sketches and documentation for inclusion in your final report when and as required.

Sincerely yours,

DE LEUW, CATHER & COMPANY

A large, stylized handwritten signature in dark ink, appearing to read "James W. Meyer". The signature is written over the typed name and title.

James W. Meyer, Chief  
Traffic and Transportation Division











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1

## BERKELEY MARINA TRAFFIC

### ASSUMED COMPOSITION

1. Junior College — 3000 Day Students

60-70 Acres

2. Specialty Shops  $\approx$  5,000 gr. sq. ft

3. Motel — 50 to 60 units

4. Restaurants — 2 @ 200 seats

5. Offices — 20,000 gr. sq. ft

6. Golf Course — 18 hole

7. Heliport

8. Marina — 400 Berths

Boat House

Yacht Club

Boat Repair





1707

CH3

2

TRIP GENERATION

| LAND USE        | QUANTITY       | GENERATION RATE |          |          | TRIPS 2-WAY |           |        |
|-----------------|----------------|-----------------|----------|----------|-------------|-----------|--------|
|                 |                | A.M. PK.        | P.M. PK. | ADT      | AM PK. HR   | PM PK. HR | ADT    |
| JUNIOR COLLEGE  | 3000 stu.      | .25             | .20      | 2.5/stu. | 750         | 600       | 7500   |
| SPECIALTY SHOPS | 60-70 A        | —               | 4        | 35/1000  | —           | 20        | 150    |
| MOTEL           | 5000 sq. ft.   | .75             | .75      | 3/UNIT   | 45          | 45        | 180    |
| RESTAURANT      | 400 seats      | —               | 1        | 4/sest   | —           | 400       | 1600   |
| Office          | 20,000 sq. ft. | 3               | 3        | 13/1000  | 60          | 60        | 240    |
| Golf Course     | 18 h.le        | —               | —        | —        | —           | 75        | 750    |
| Helipert        |                |                 |          |          | 30          | 30        | 100    |
| Marina          | 400 Berths     | .3              | .5       | 4.2/200  | 120         | 200       | 1700   |
| TOTAL           |                |                 |          |          | 1000        | 1430      | 12,250 |

AM PEAK HR — 1000 veh enter  
 PM PEAK HR — 600 veh enter  
 830 veh leave

400  
 50  
 20,000



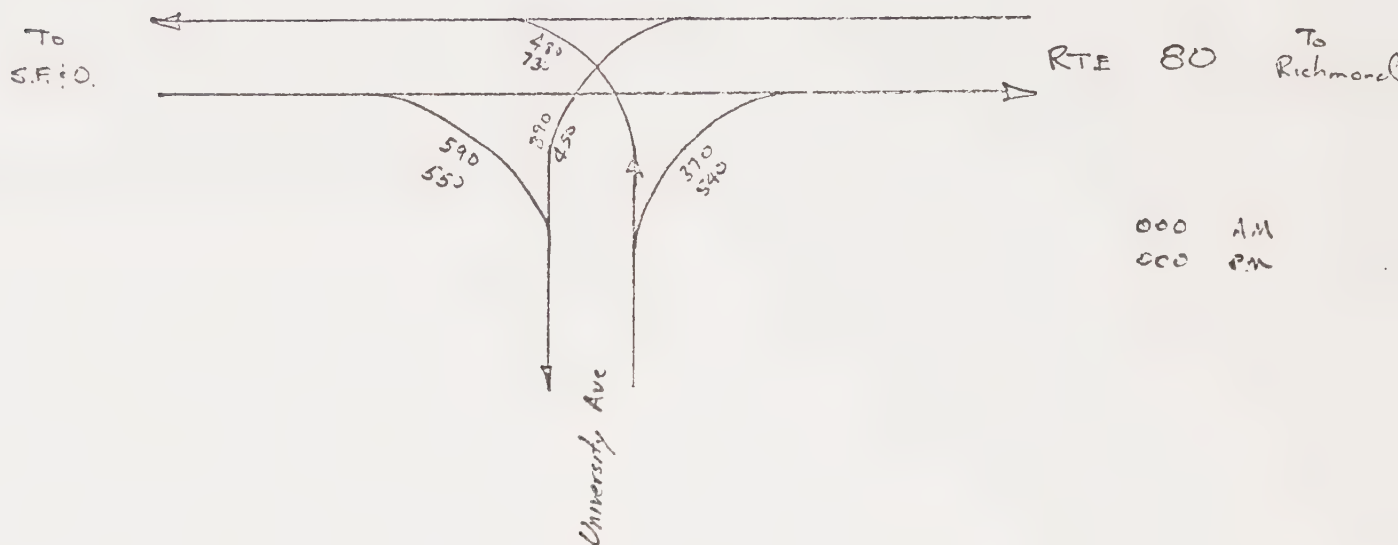


# TRIP DISTRIBUTION

SOURCE: ALAMEDA CTY. HIGHWAY MASTER PLAN 1959  
1980 Distribution from ZONE NEAR

|                |     |   |     |
|----------------|-----|---|-----|
| FREEWAY        | N.B | — | 30% |
| FREEWAY        | S.B | — | 45% |
| UNIVERSITY AVE | —   | — | 25% |

1965 TRAFFIC



000 AM  
000 PM

|    |         |    |            |     |
|----|---------|----|------------|-----|
| AM | Freeway | N. | 900        | 60% |
|    | Freeway | S. | <u>600</u> | 40% |
|    | Total   |    | 1500       |     |



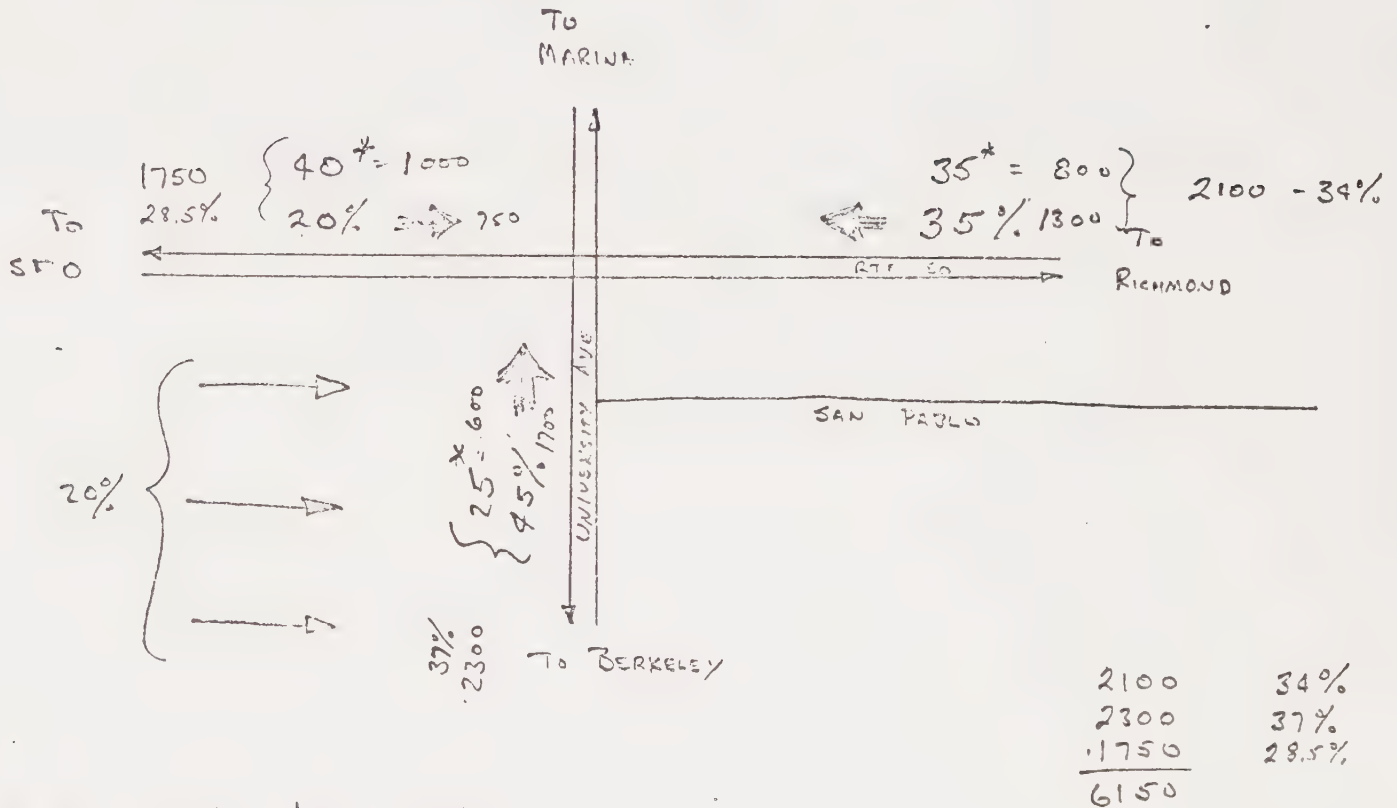


# DISTRIBUTION CONTINUED

Actual From Existing Marina Facilities

|              |                    |            |
|--------------|--------------------|------------|
| Freeway N -  | 230 + 2590 = 2820  | 36%        |
| S -          | 100 + 2970 = 3070  | 40%        |
| UNIVERSITY - | 1850 = <u>1850</u> | <u>24%</u> |
| Total        | 7740               | 100        |

## FINAL DISTRIBUTION

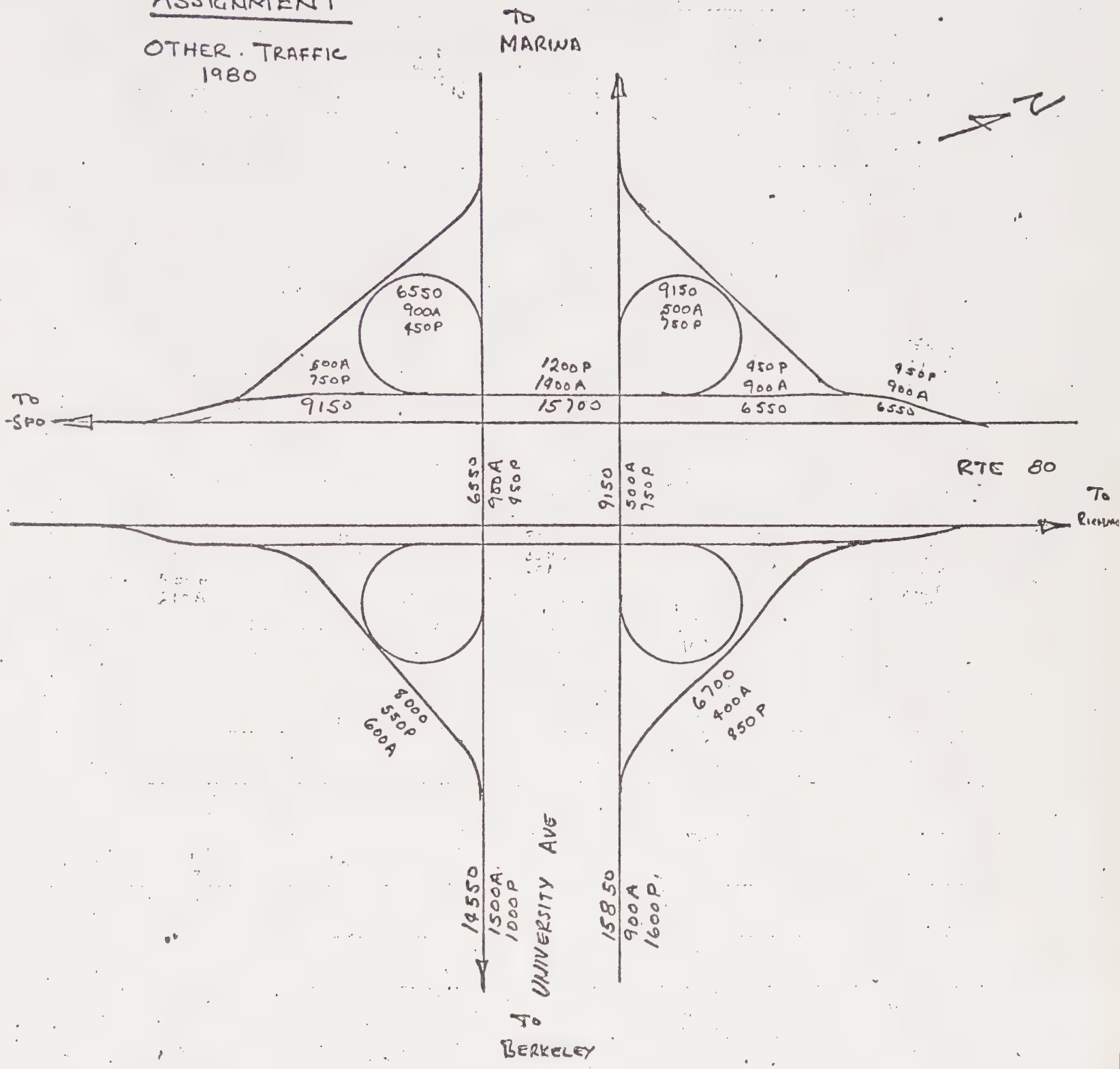


\* All but Junior College



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ASSIGNMENT  
OTHER TRAFFIC  
1980







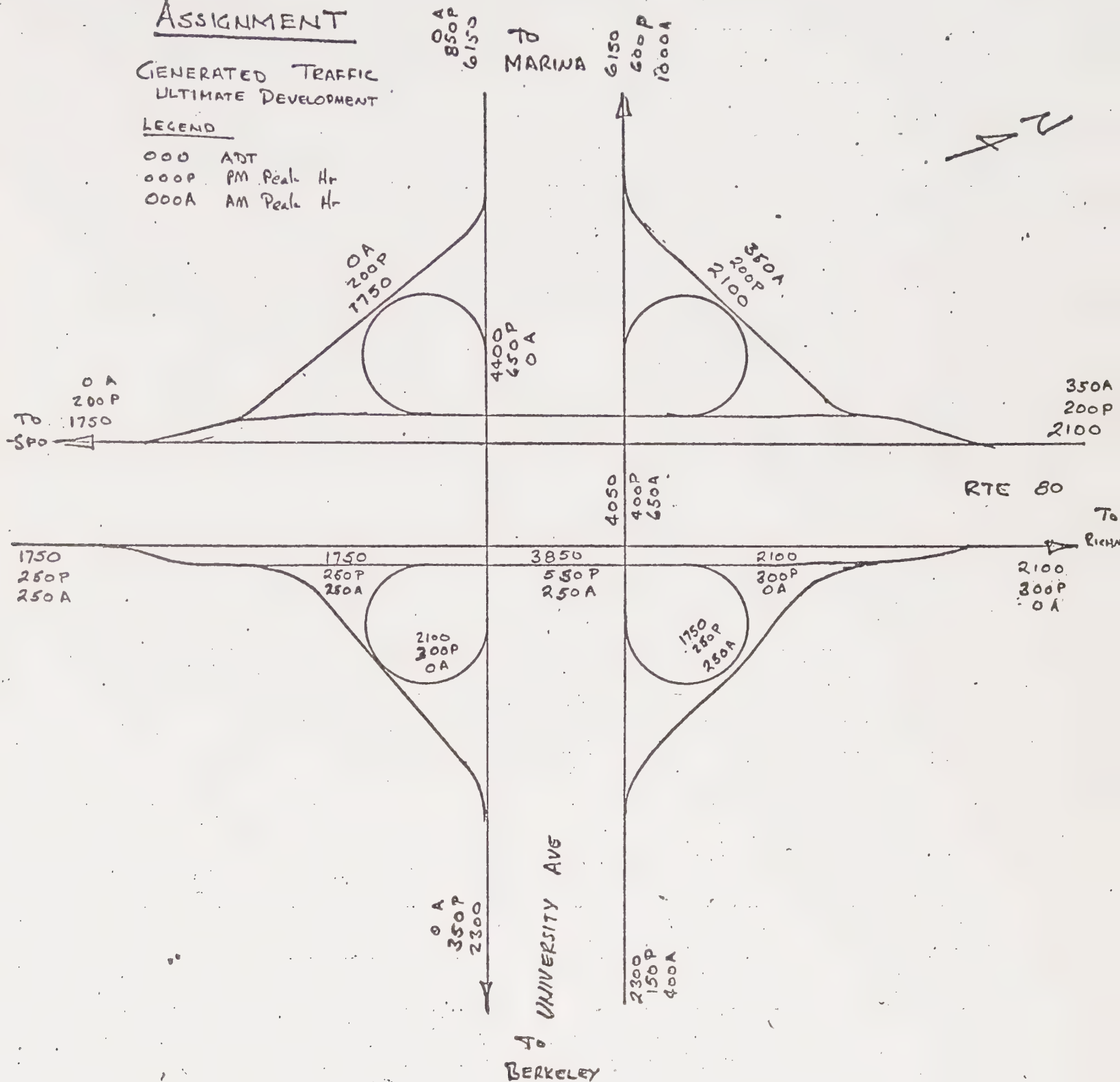
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#7

# ASSIGNMENT

GENERATED TRAFFIC  
ULTIMATE DEVELOPMENT

## LEGEND

000 ADT  
000P PM Peak Hr  
000A AM Peak Hr







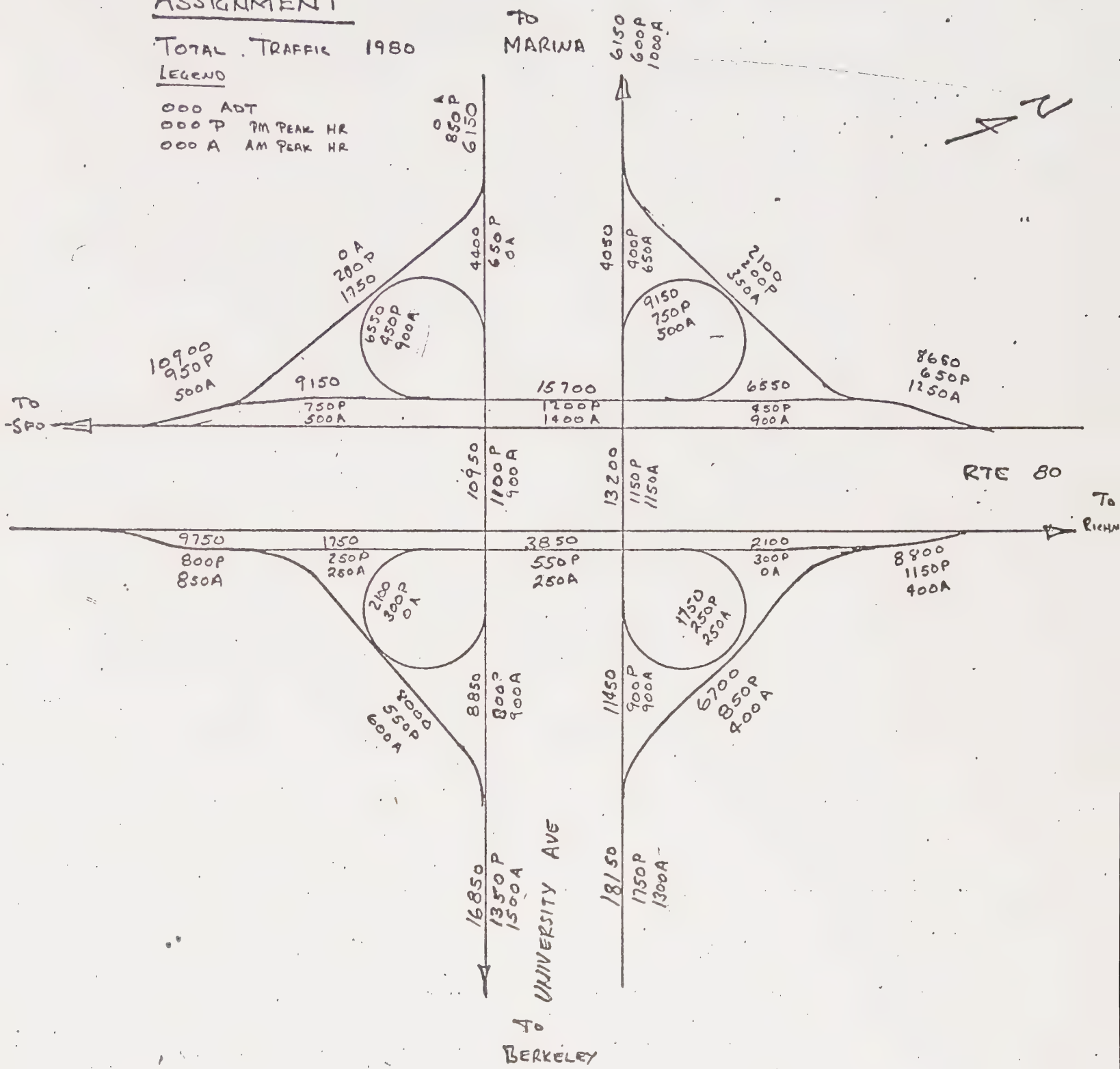
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# ASSIGNMENT

TOTAL TRAFFIC 1980

## LEGEND

000 ADT  
000 P PM PEAK HR  
000 A AM PEAK HR

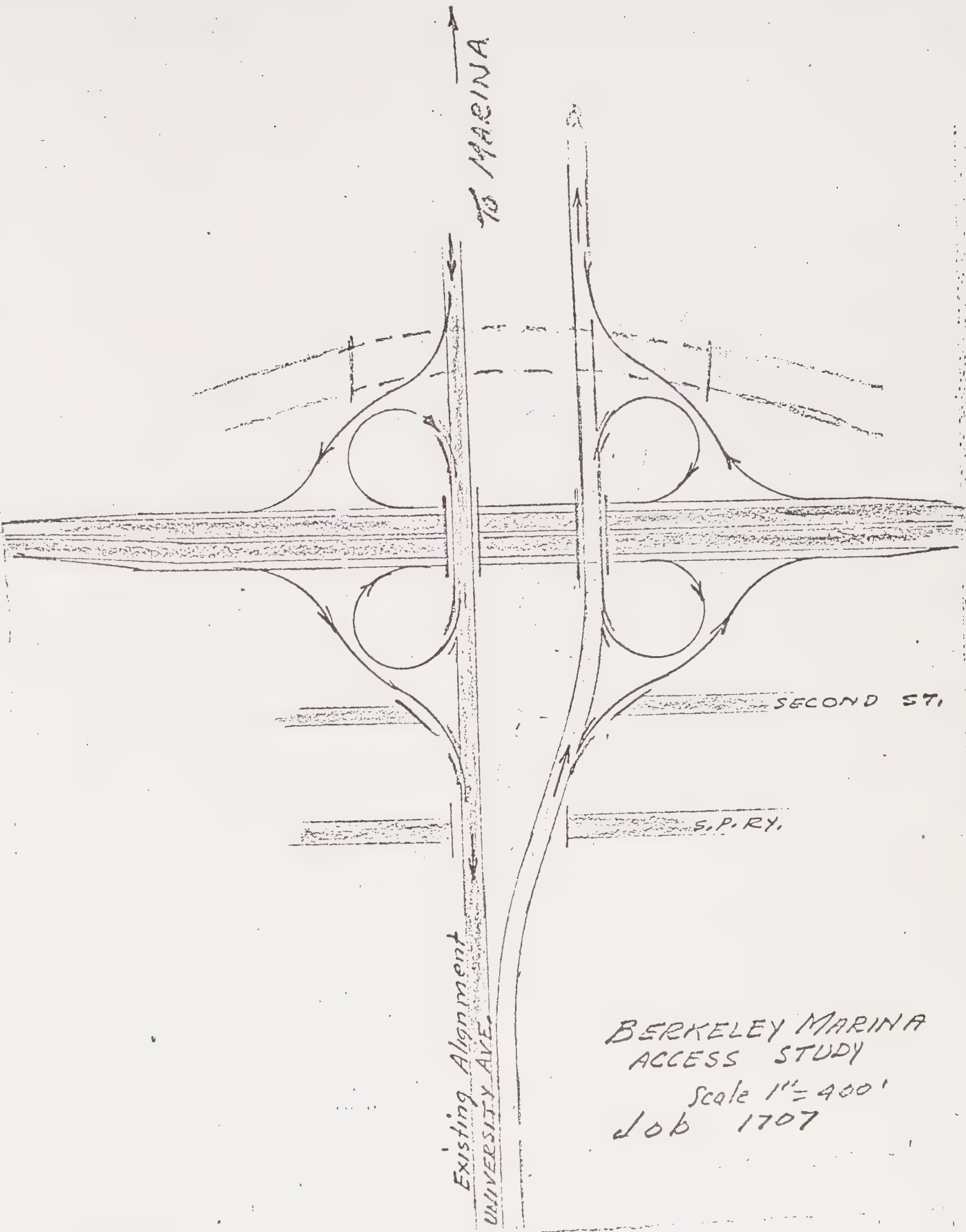










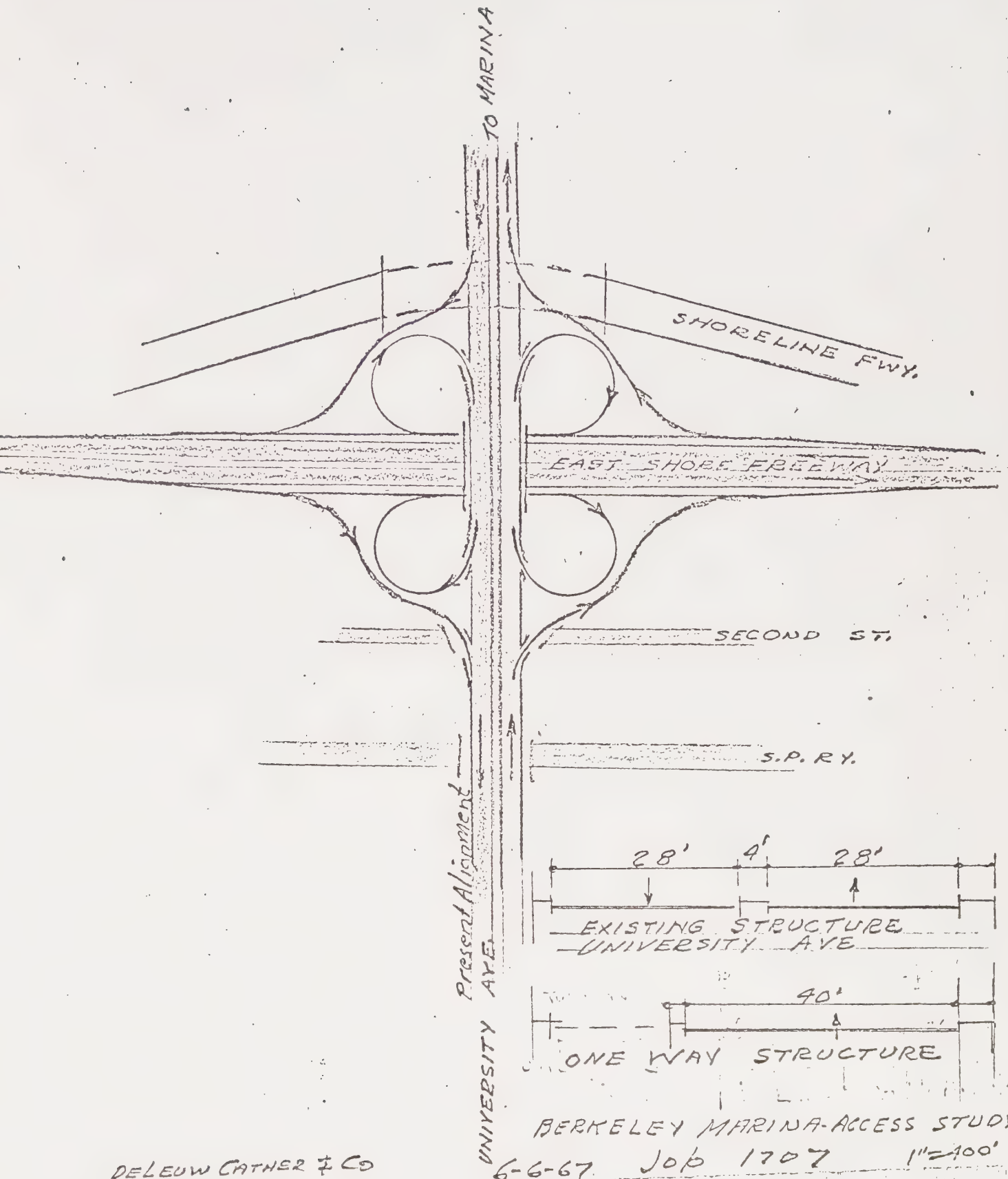


BERKELEY MARINA  
ACCESS STUDY

Scale 1" = 400'  
Job 1707

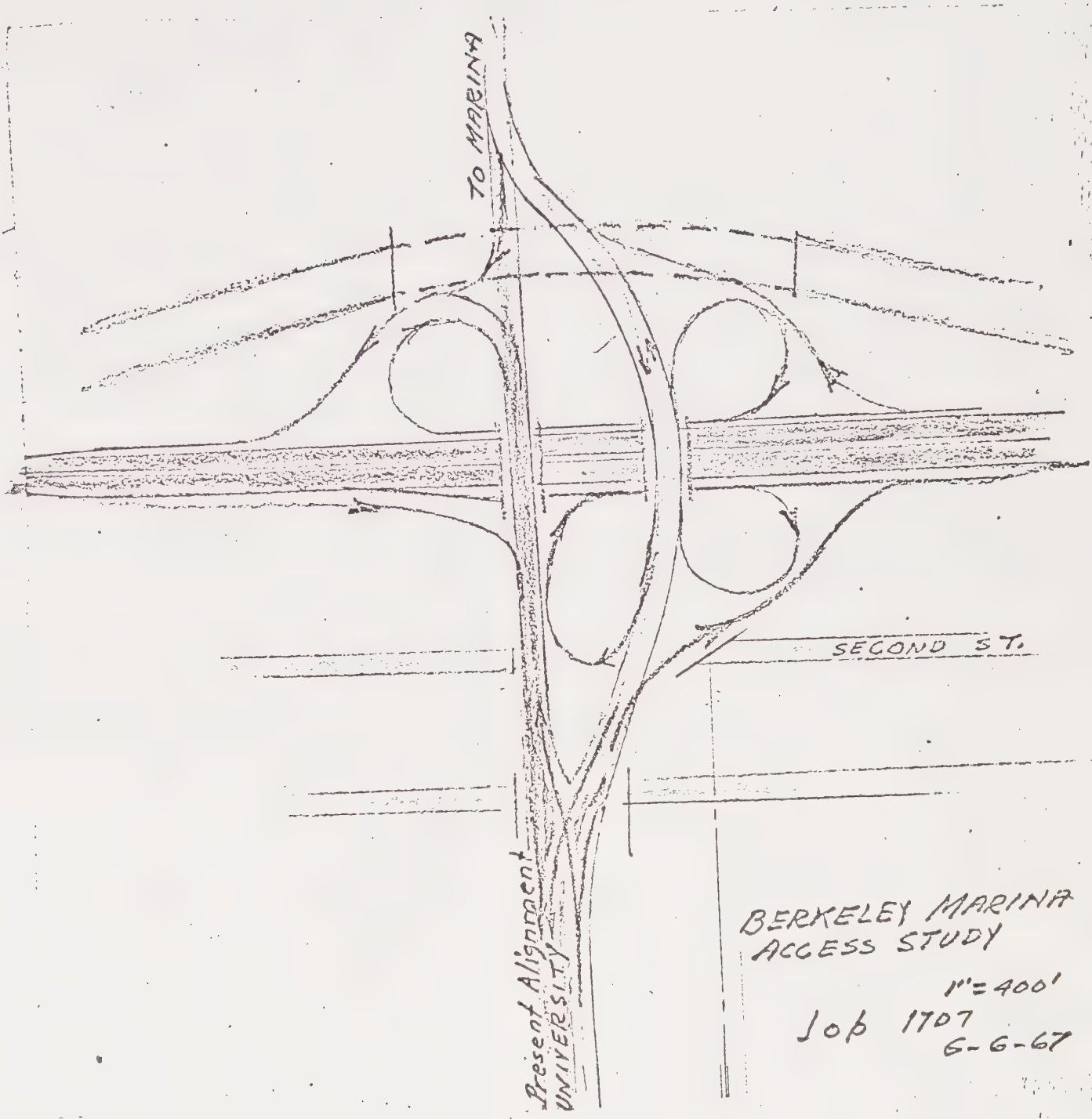






DELEUW CATHNER & CO



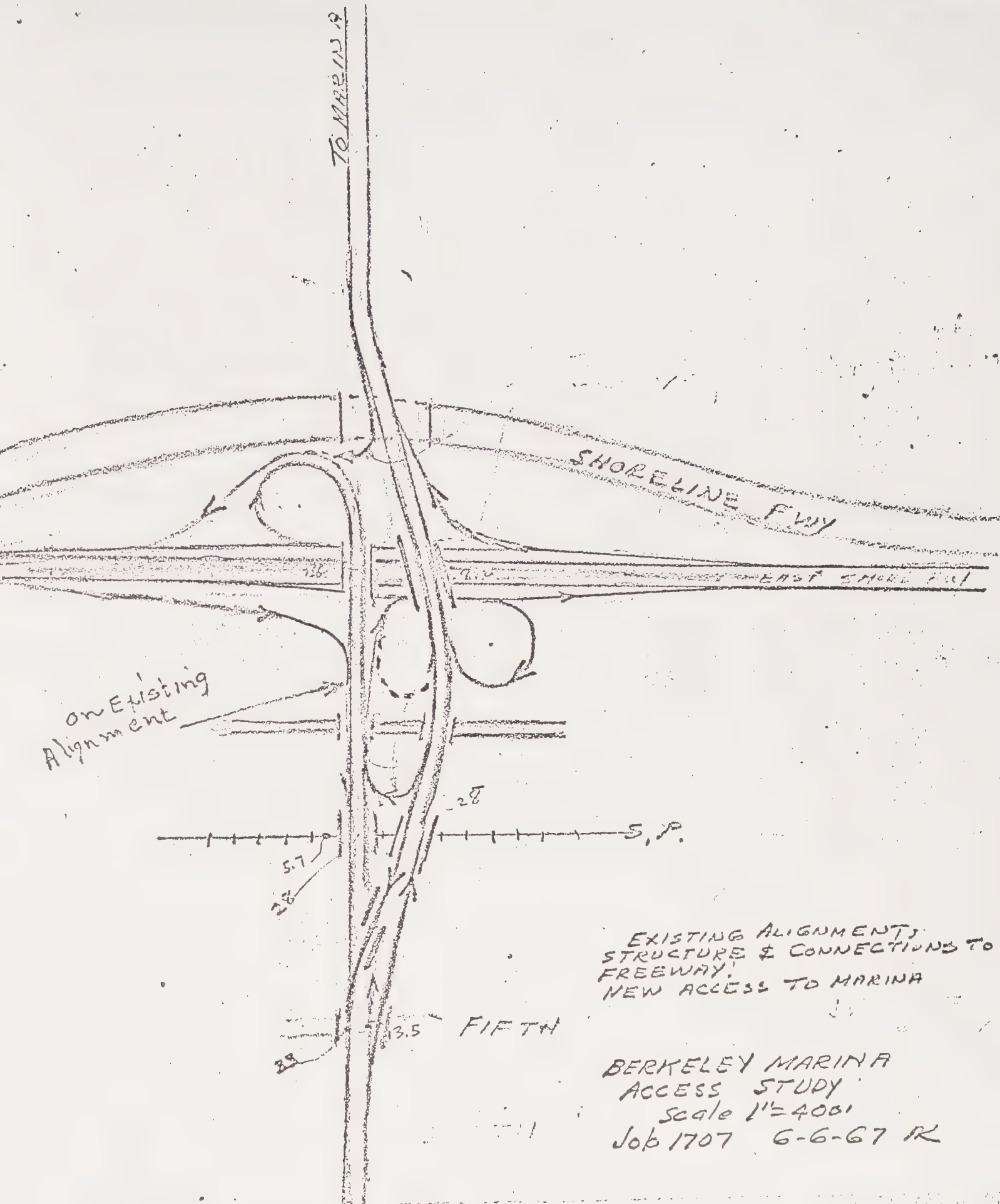


BERKELEY MARINA  
ACCESS STUDY

1"=400'  
Job 1707  
6-6-67







EXISTING ALIGNMENTS,  
STRUCTURE & CONNECTIONS TO  
FREEWAY.  
NEW ACCESS TO MARINA

BERKELEY MARINA  
ACCESS STUDY  
Scale 1"=400'  
Job 1707 6-6-67 RK









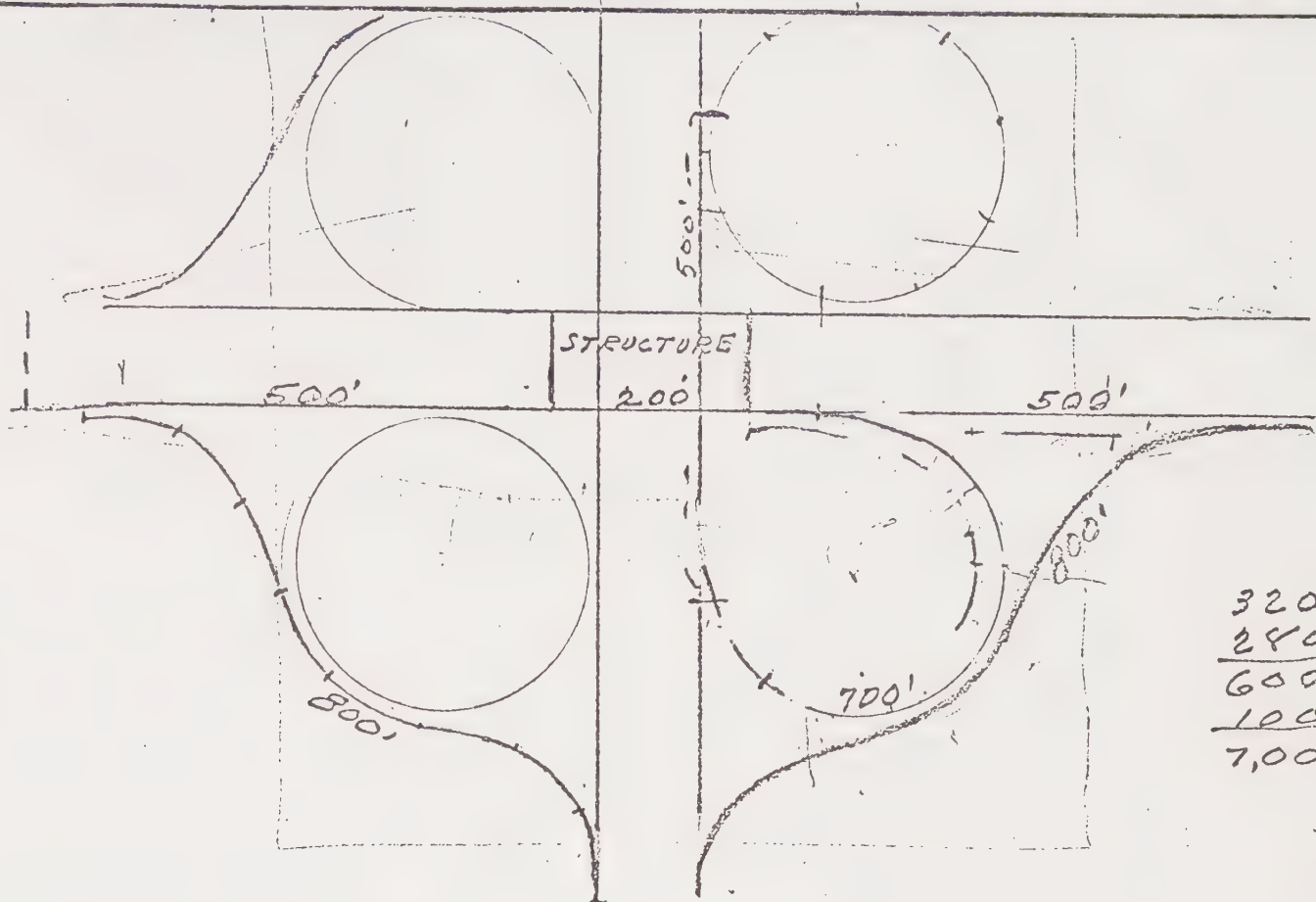
DE LEUW, CATHER &amp; CO.

ENGINEERS

SAN FRANCISCO, CALIF.

SUBJECT Level Leg Interchange JOB NO. \_\_\_\_\_Estimated Cost

SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

MADE BY K DATE 9-67 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

|             |
|-------------|
| 3200        |
| 2800        |
| <hr/> 6000  |
| <hr/> 1000  |
| <hr/> 7,000 |

|                                  |                 |           |
|----------------------------------|-----------------|-----------|
| Loops & Ramps                    | 7000 X #70 =    | \$490,000 |
| Main Roadway                     | 1000 X #165 =   | 165,000   |
| Structure                        | 200 X 90 X 15 = | 270,000   |
| Demolitions - Clearing Grubbing  |                 | 25,000    |
| Utility Adjustment               |                 | 30,000    |
|                                  | <hr/> #         | 980,000   |
| Engineering & Contingencies +30% |                 | 290,000   |
|                                  | <hr/> #         | 1,270,000 |





136

Borrow  $18^{\text{cu}} \text{yd. ft} \times 7000 = 126,000 \text{ cu yds.}$   
 $45 \text{ " } \times 1000 = \underline{45,000 \text{ cu. yds}}$   
 TOTAL =  $171,000 \text{ cu. yds}$   
 $171,000 \times \$1.50$

# 256,000

Pavement  $18 \times 6000 = 108,000 \text{ sq ft}$   
 $72 \times 1000 = \underline{72,000 \text{ "}}$   
 $180,000 \times \$0.80$

144,000

Curb,  $2 \times 6000 = 12,000 \text{ Lin. Ft.}$   
 $2 \times 1000 = \underline{2,000 \text{ "}}$   
 $14,000 \times 2$

28,000

Guard Rail  $\dots = 2500 \text{ Lin. Ft.}$   
 $2500 \times \$4.00$

10,000

Landscaping  $60 \times 6000 = 360,000 \text{ sq. ft.}$   
 $20 \times 1000 = \underline{20,000 \text{ "}}$   
 $380,000 \times \$0.10$

38,000

Drainage  $90 \times 6000 = 540,000 \text{ sq ft}$   
 $100 \times 1000 = \underline{100,000 \text{ "}}$   
 $640,000 \times \$0.10$

64,000

Sign. Light  $6000 = 6000 \text{ Lin. Ft}$   
 $1000 = \underline{1000 \text{ "}}$   
 $7,000 \times 8.00$

56,000

Fence  $\dots = 4000 \text{ Lin. Ft.}$   
 $4000 \times 2.00$

8,000

Sidewalks  $8 \times 4000 = 32000 \text{ sq. Ft.}$   
 $32000 \times 0.50$

16,000

624,000

Structure  $200 \times 90 \times 15 =$

270,000

# 894,000

Demolitions Clearing & Grubbing  
 Utility Adjustments

25,000

30,000

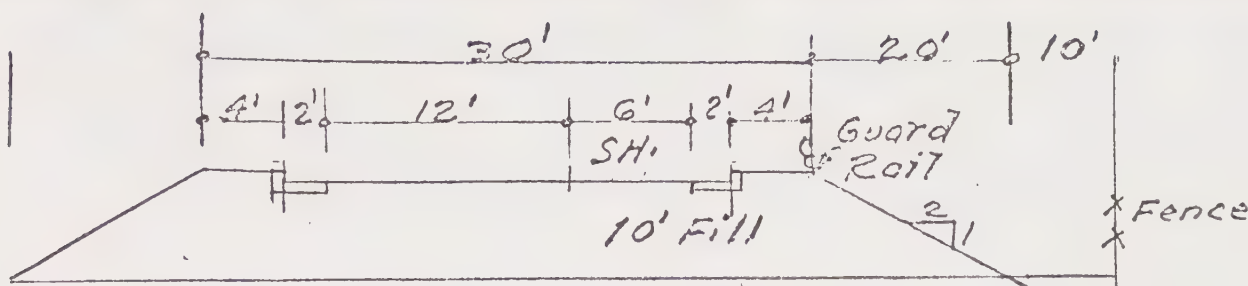
950,000

280,000

+30%

# 7,130,000





|                                      |                                |                     |            |                 |
|--------------------------------------|--------------------------------|---------------------|------------|-----------------|
| 10' Fill Section:                    | $\frac{50 \times 10}{27} = 19$ | PER LIN. FT.        | UNIT PRICE | \$ PER LIN. FT. |
| Borrow @ Fill 20' cu. yd/ft in place | 19 cu. yd                      | \$100               | \$200      | \$19 36         |
| Prmt. incl Base in place             | 13 ft                          | 0.70-1.00           |            | 13 18           |
| Curbs                                | 2 ft                           | 2.00-2.50           |            | 4 5             |
| Guard Rail, Beam Type                | 2 ft                           | 400-450             |            | 8 9             |
| Land Scaping                         | 60 ft                          | 0.10-0.25           |            | 6 15            |
| Drainage                             | 90 ft                          | 0.10 -              |            | 9 9             |
| Sign Light                           | Lump                           | -                   |            | 8 12            |
| Chain Link - Fencing - CL6 - (6')    | 2                              | 200-250             |            | 4 5             |
|                                      |                                | PER LIN. FT. TOTAL  |            | \$ 70 108       |
|                                      |                                | Engineering + 10%   |            | 7 18            |
|                                      |                                | Contingencies + 20% |            | 14 21           |
|                                      |                                | TOTAL               |            | \$ 91 140       |

20' Fill = 52 cu. yd. per ft @ 100 = 52

Cement Treated Base 0.50' Thick  
mixing #006 sq. ft.  
Aggregate 0.07  
Cement 0.10  
Water & Seal 0.02  
# 0.25 sq. ft.

|                         |              |                |
|-------------------------|--------------|----------------|
| 0.25' Asph. Conc.       | #200 T.      | \$0.15 to 0.25 |
| 0.50' Cem. Treated Base | #1350 cyd    | 0.25           |
| 1.00' Sub base Class 2  |              | 0.20           |
| 1.75' TOTAL THICKNESS   |              | # 0.60 sq. ft  |
| 0.67' Conc.             | #3400 cu. yd | \$ 0.53        |
| 0.35' Cem. Treated Base |              | 0.18           |
| 0.50' Subbase - CL2     |              | 0.15           |
| 1.52'                   |              | # 0.86 sq. ft  |

Use \$0.70 to \$1.00 sq. ft.

Based on Average Contractors Bid Prices  
Add 10% Engineering





DE LEUW, CATHER &amp; CO.

ENGINEERS

SAN FRANCISCO, CALIF.

SUBJECT

STREET

JOB NO.

Estimated

Cost

SHEET NO.

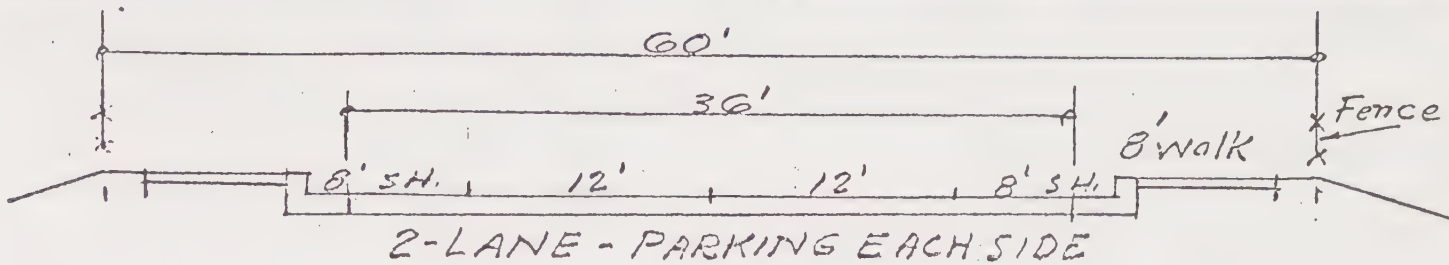
OF

MADE BY

DATE 7-67

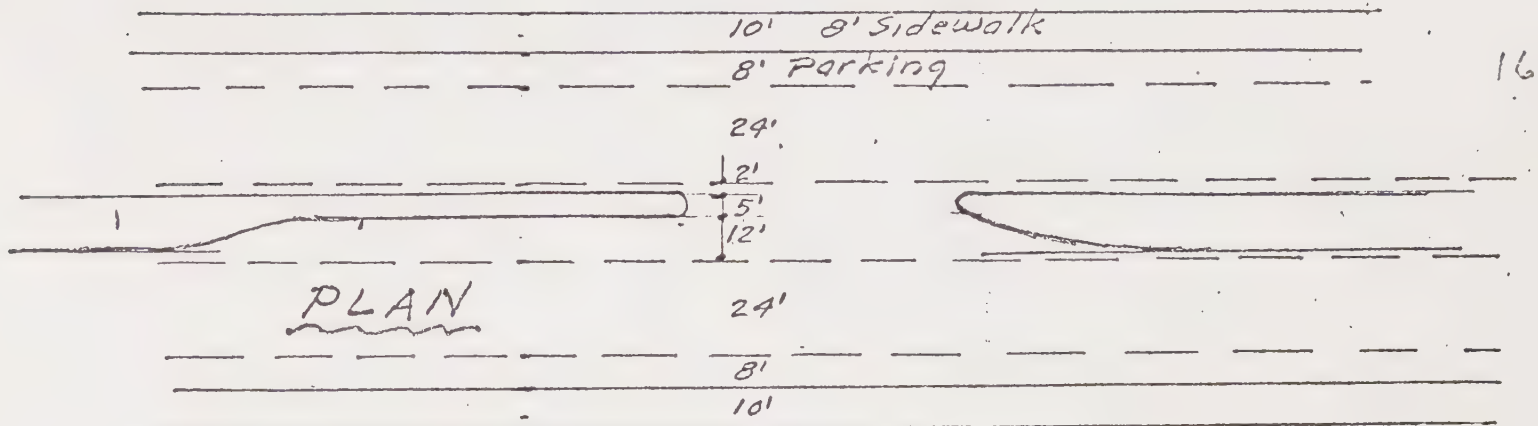
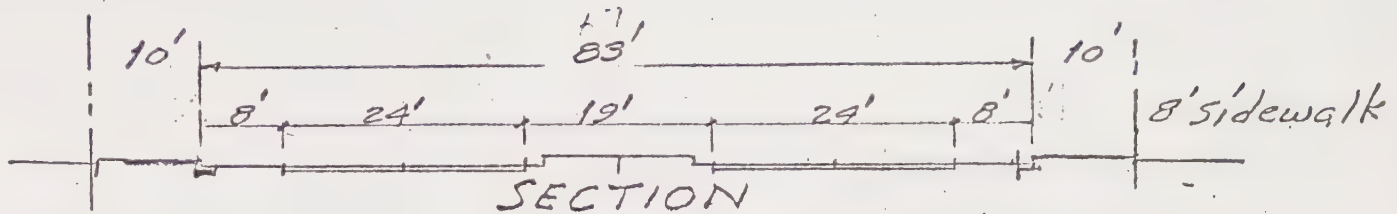
CHECKED BY

DATE



|              | UNIT<br>PER | UNIT<br>PRICE | \$<br>PER<br>LIN. FT. | \$     |
|--------------|-------------|---------------|-----------------------|--------|
| Excav.       | 5 LIN. FT.  | \$1.00        | 5                     | 5      |
| Pavement     | 36          | 0.70-1.00     | 25                    | 36     |
| Curbs        | 2'          | 200-250       | 4                     | 5      |
| Guard Rail   | 2'          | 400-450       | -                     | -      |
| Fence        | 2'          | 200-250       | 4                     | 5      |
| Landscaping  | Lump        | 0.10-         | 5                     | 5      |
| Drainage     | 60          | 0.10          | 6                     | 6      |
| Sign. Light  |             | Lump          | 8                     | 10     |
| Side walks   | 16          | 0.50          | 8                     | 8      |
| TOTAL        |             |               | \$ 65                 | \$ 80  |
| + 10%        |             |               | 6                     | 8      |
| + 20%        |             |               | 13                    | 16     |
| PER LIN. FT. |             |               | \$ 84                 | \$ 104 |





|                      | PER<br>FT. | UNIT PRICE  | PER LIN. FT.    |
|----------------------|------------|-------------|-----------------|
| Excavation - Cu. Yd. | \$5        | \$ 100 2.00 | \$ 5.00 \$10.00 |
| Pavement - Sq. ft    | 72         | 0.70 1.00   | 50 70           |
| Curbs - Lin. Ft      | 4          | 2.00 2.50   | 8 10            |
| Guard Rail - Lin. Ft | 2          | 4.00 4.50   | - =             |
| Fence - Lin. Ft      | 2          | 2.00 2.50   | 4 5             |
| Landscaping - Sq. ft | Lump       | 0.10 0.25   | 2 5             |
| Drainage - Sq. ft    | 100        | 0.10 0.10   | 10 10           |
| Signing Lighting     |            | 8.00 10.00  | 8 10            |
| Side walks - ft      | 16         | 0.50 0.50   | 8 8             |

|                    |       |       |           |
|--------------------|-------|-------|-----------|
| PER LIN. FT. TOTAL | 95    | 128   | 95        |
| Engineering + 10%  | 10    | 13    | 70 Borrow |
| Contingencies 20%  | 19    | 26    | 165       |
|                    | \$124 | \$167 | 17        |
|                    |       |       | 33        |
|                    |       |       | \$215     |

#655,000

# TO

#880,000 MILE

10' FILL = 45 cu yd / Ft. Borrow @ \$1.50 cu. yd = \$70





DE LEUW, CATHER &amp; CO.

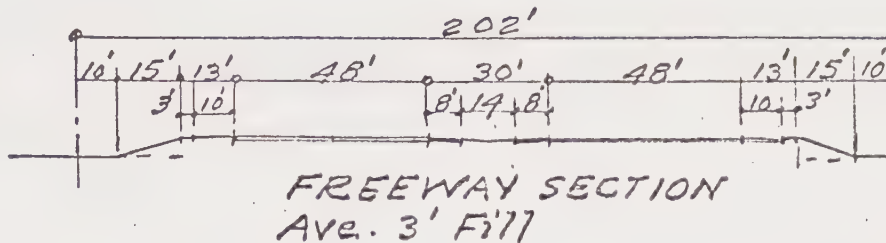
SUBJECT 8 LANE FREEWAY

JOB NO. \_\_\_\_\_

ENGINEERS

SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_

SAN FRANCISCO, CALIF.

MADE BY AK DATE 8-6-7 CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_

|                    | PER FT.    | UNIT PRICE    | \$ per Lin. Ft. |
|--------------------|------------|---------------|-----------------|
| 3' Fill- Borrow    | 19 cu. yd. | \$1.00 \$2.00 | \$19.00 \$38    |
| Pavement           | 96 sq. ft. | 0.70 1.00     | 70 96           |
| Shoulders          | 28 " "     | 0.50 0.50     | 14 14           |
| Curbs. Bituminous  | 2 Lin. Ft. | 0.50 0.50     | 1 1             |
| Guard Rail         | 2 " "      | 4.00 4.00     | - -             |
| Fence              | 2 " "      | 2.00 2.50     | 4 5             |
| Landscaping        | 64 sq. ft. | 0.10 0.25     | 6 16            |
| Drainage           | 200 " "    | 0.05 0.10     | 10 20           |
| Signing, Lighting  | Lin. Ft.   | 10.00 10.00   | 10 10           |
|                    |            |               | \$134 \$200     |
|                    |            | +1090         | 13 20           |
|                    |            | +20           | 27 40           |
|                    |            |               | \$174 \$260     |
| TOTAL PER LIN. FT. |            |               |                 |

\$920,000

TO

\$1,250,000 MI.



ENGINEERS

SAN FRANCISCO, CALIF.

MADE BY Ke DATE 2-67 CHECKED BY DATESan Antonio Road Overpass  
BID PRICES

|                               | Engineers<br>Estimate | Low<br>Bid       |
|-------------------------------|-----------------------|------------------|
| Demolitions                   | \$12,500              | \$5,000          |
| Excav. Pymt. Removal, Borrows | 147,850               | 140,850          |
| Paving                        | 141,800               | 137,000          |
| Curb & Gutter, Sidewalk       | 47,600                | 40,600           |
| Signs & Lights                | 67,300                | 52,600           |
| Fence                         | 3,200                 | 2,900            |
| Landscaping                   | 13,000                | 18,500           |
| Utility Adjustments           | 28,150                | 30,700           |
| Eng Office                    | 4,000                 | 3,000            |
|                               | <u>\$465,400</u>      | <u>\$431,150</u> |

Planting ?

|            |                    |                  |
|------------|--------------------|------------------|
| structures | \$553,000          | \$611,000        |
| Extra Work | 25,000             | 25,000           |
|            | <u>\$1,043,400</u> | <u>1,067,150</u> |





Prepared By:

ECKBO, DEAN, AUSTIN & WILLIAMS

Landscape Architects, Urban Designers, Environmental Planners

145 Mission Street

San Francisco, California 94105

## HELISTOP LOCATION STUDY

Berkeley Waterfront

Berkeley, California

March 29, 1971

### PART I: Design Criteria

The following was developed with Art Tobey of the San Francisco Helicopter Service and F.A.A. Heliport Design Guide. The alternative sites were chosen based on this criteria and potential adjacent land use. Such questions as noise, obstructions, accessibility and available land were considered.

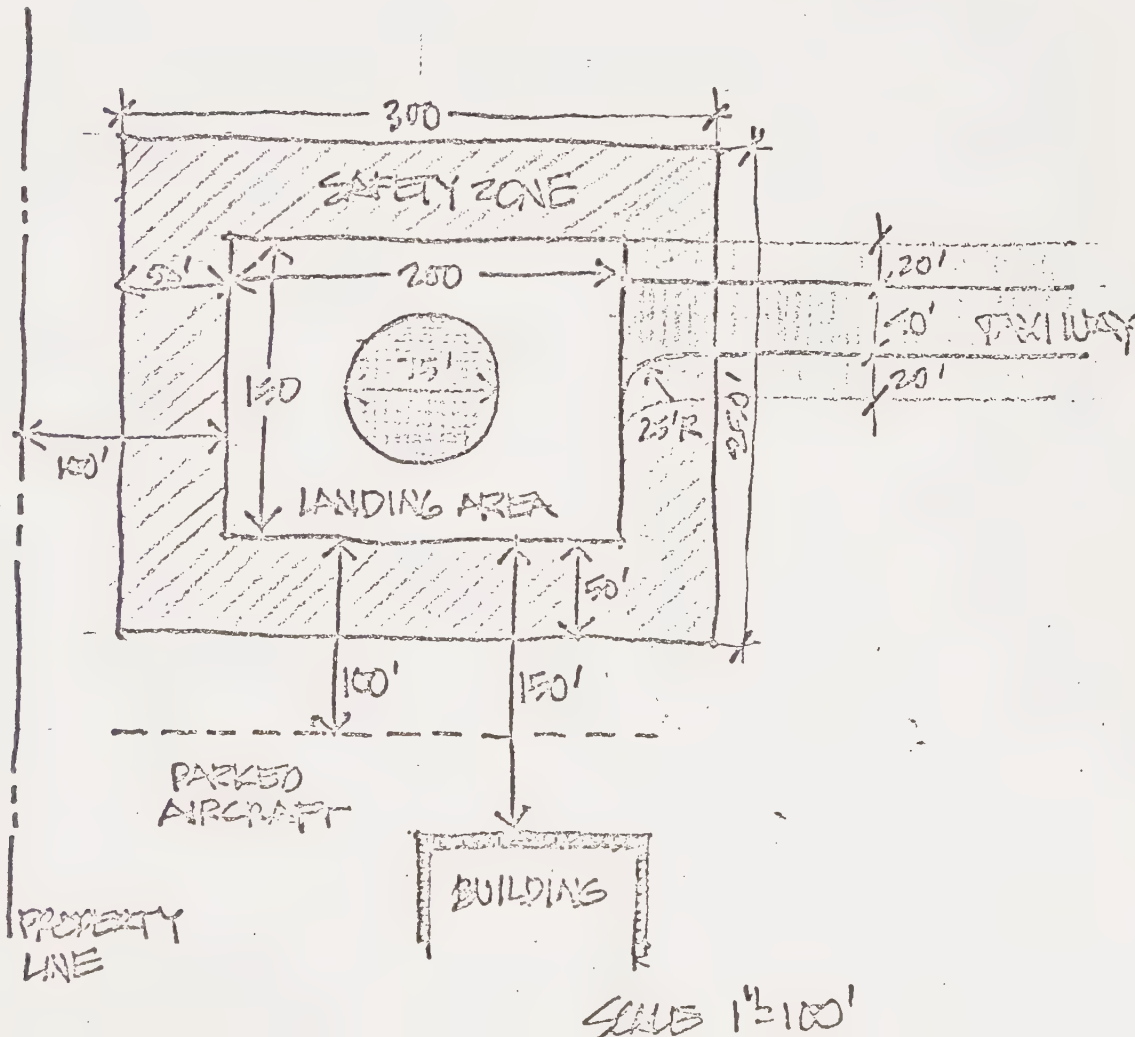


March 26, 1971

Art Tobey  
San Francisco Helicopter Service

Notes from a telephone conversation 3-25-71

- Current helicopter in service is 75' long with a 62' rotor diameter.
- The helicopter to be used two years from now will be 100' long with a 75' rotor diameter.
- The service facility for Berkeley should be considered a Helistop, not a Heliport. It should allow for the loading and unloading of one helicopter. Space should also be provided for an emergency maintenance area.
- The desired line of approach for landing in the Berkeley Waterfront area is from the Albany side with the line-up for landing and landing directly into the prevailing wind. This usually means landing facing the Golden Gate Bridge. Take off follows the same pattern.







## BERKELEY WATERFRONT HELISTOP

## LATERAL CLEARANCES

## CLASS III

|                                     |      |
|-------------------------------------|------|
| Landing Area to<br>Parked Aircraft: | 100' |
| Landing Area<br>to Buildings:       | 150' |
| Landing Area to<br>Property Line    | 100' |
| C/L Taxiway to<br>Obstacle:         | 100' |
| C/L of Ver //<br>Approaches:        | 300' |

## LANDING AREA

|                 |                          |
|-----------------|--------------------------|
| Length:         | 2x Copter Length = 200'  |
| Width:          | 1.5x Copter Width = 150' |
| Touchdown Area: | 1 Rotor Diameter = 75'   |
| Safety Zone:    | 1/2 Copter Length = 50'  |
| Pavement Slope: | 2% Max.                  |

## TAXIWAY

|                   |                        |
|-------------------|------------------------|
| Width:            | 40'                    |
| Radius of Fillet: | 25' Min.               |
| Shoulder Width:   | 20'                    |
| Shoulder Slope:   | 5% for 10'<br>3% After |



### APPENDIX 3. SUMMARY OF RECOMMENDED DESIGN CRITERIA

| GEOMETRIC CRITERIA  | DESIGN CRITERIA   | COMMENT   |
|---|---|---|
| Length of Landing Area—<br>Class I (Private)<br>Class II (Small Public)<br>Class III (Large Public) | 1.5 times overall helicopter length<br>2.0 times overall helicopter length<br>2.0 times overall helicopter length                                 | To preclude premature obsolescence, the size of future aircraft must be considered and planned for. Special consideration must be given elevated heliports.                 |
| Width of Landing Area—<br>Class I<br>Class II<br>Class III  | 1.5 times overall helicopter length<br>1.5 times overall helicopter length<br>1.5 times overall helicopter length                                 | Same as above.  |
| Length and Width of Touchdown Area—<br>Class I<br>Class II<br>Class III                             | One rotor diameter<br>One rotor diameter<br>One rotor diameter  | Same as above.  |
| Width of Peripheral Area—<br>Class I<br>Class II<br>Class III                                       | $\frac{1}{4}$ overall helicopter length, 10' min.<br>$\frac{1}{4}$ overall helicopter length, 10' min.<br>$\frac{1}{2}$ overall helicopter length | This area constitutes a safety zone related to the landing area. Any fencing should be on the outside edge of the peripheral area. Also, no aircraft should be parked here. |
| Taxiway Width—<br>Class I<br>Class II<br>Class III  | 20 feet<br>20 feet<br>40 feet   | Hover taxiing may eliminate the need for a taxiway at Class I heliports.  |
| Pavement Slopes—  | 2.0 percent max.  |   |
| Shoulder Slope—   | 5.0 percent max. for first 10'<br>3.0 percent thereafter  | These are preferred slopes.   |
| Radius of Pavement Fillet—  | 25 feet, min.   | Fillets may be omitted at Class I heliports.  |
| Shoulder Width for Touchdown Area—<br>Class I<br>Class II<br>Class III                              | Varies<br>10 feet<br>Out to edge of landing area  |   |
| Shoulder Width for Taxiways and Aprons—<br>Class I<br>Class II<br>Class III                         | Varies<br>10 feet<br>20 feet  |   |





| LATERAL CLEARANCES  | DESIGN CRITERIA                  | COMMENT  |
|---|----------------------------------|--|
| Edge of Landing Area to Edge of Parked Aircraft—<br>Class I<br>Class II<br>Class III          | 25 feet<br>50 feet<br>100 feet   | No portion of the aircraft should penetrate the transitional surface.  |
| Edge of Landing Area to Building Line—<br>Class I<br>Class II<br>Class III                    | Varies<br>50 feet<br>150 feet    | Building should not penetrate the transitional surface. Assumes parking apron between building and landing area. Predicated upon ILS requirements.                 |
| Edge of Landing Area to Property Line (Nonterminal Side)—<br>Class I<br>Class II<br>Class III | Varies<br>50 feet<br>100 feet    | Building at property line should not penetrate transitional surface. Provides clearance for two-story building at property line. Predicated upon ILS requirements. |
| Separation Between Centerlines of Parallel VFR Approaches—<br>Class I and II<br>Class III     | 200 feet, min.<br>300 feet, min. | For simultaneous VFR operations.<br>For simultaneous VFR operations.   |
| Centerline of Taxiway to Obstacle—<br>Class I<br>Class II<br>Class III                        | Varies<br>50 feet<br>100 feet    | Rotor tip should clear obstacle by minimum of 10 feet.   |



## PART II: Site Analysis

### A. Site I:

1. Disadvantages - location close to highway and University Avenue requires the landing and take-off patterns to become undesirable.
  - Adjacent to mud flats where birds forage and a fishing location.
2. Advantages - *access*.
  - Near freeway and University Avenue.

### B. Site II:

1. Disadvantages
  - Flight patterns over potential park open space land. This might create an area people wouldn't use because of noise and concern for their safety.
2. Advantages
  - Location allows a good flight pattern, no present obstructions.
  - Close to road.

### C. Site III:

1. Disadvantages
  - Site located on potential recreation land.
  - Long way from highway.
2. Advantages
  - Probably the best location for a desirable flight pattern.
  - Travels over least amount of land.
  - Adjacent to road, future motel.





D. Site IV: Pier Construction

1. Disadvantages

- Requires pier construction.
- Requires a mini bus system to be purchased and operated.
- Noise might bother fisherman and destroy serenity of the pier.

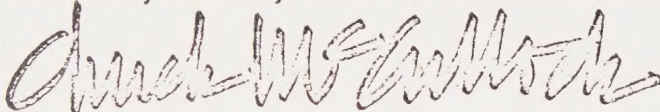
2. Advantages

- Would not use any dry land that could be used for open space recreation.
- Desirable flight patterns.

PART III: Summary

Site III seems to be the most desirable location for a new helistop. The flight patterns pass only a short distance over land. It is adjacent to a road and a future motel. There are no vertical obstructions in the flight pattern.

ECKBO, DEAN, AUSTIN & WILLIAMS

A handwritten signature in cursive script, reading "Charles M. McCulloch".

Charles M. McCulloch  
Senior Associate



U.C. BERKELEY LIBRARIES  
CJ24906384



